ASM REVIEW OF METAL LITERATURE

1954

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REVIEW OF METAL LITERATURE

An Annotated Survey of Articles and Technical Papers Appearing in the Engineering, Scientific and Industrial Journals and Books, Here and Abroad, Received in the Library of Battelle Memorial Institute, Columbus, Ohio.

Volume 11

1954

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PREFACE

The A.S.M. Review of Metal Literature is a monthly feature of Metals Review, published by the American Society for Metals and distributed to its members. The present volume is a collection of the installments published in Metals Review from January through December 1954. It is the eleventh volume in a series that began in 1944.

The annotations are not intended to serve as a substitute for a reading of the articles listed. They are brief abstracts designed to indicate the scope and content of the article so that the reader may determine whether it is something he wants to read in its entirety. In other words, they are indicative rather than informative abstracts.

The method of classifying the annotations into subject subdivisions is based upon the "ASM-SLA Metallurgical Literature Classification," designed by a joint committee of the American Society for Metals and the Special Libraries Association, and published by the American Society for Metals during 1950.

The table of contents lists the main headings into which the A.S.M. Review of Metal Literature is subdivided, together with secondary subdivisions indicating the scope of the main heading. The main sections are designated by capital letters, and individual annotations are identified by the appropriate capital letter preceded by a serial number. Each annotation in the text of the book is likewise followed by code symbols which refer to these main subdivisions, together with numerals which refer to subdivisions of the main classifications as listed in the table of contents. These numerals refer to the coding system used in the "ASM-SLA Metallurgical Literature Classification." For example, the symbol "C21" in parentheses at the end of an annotation indicates that the literature reference has to do with "Nonferrous Smelting and Refining" (C), and, specifically, "Smelting" (21).

The main divisions of the classification refer primarily to "processes and properties," with a final section "V" to include literature references dealing with specific materials and covering various processes and properties in a broad and general way. Materials are likewise coded by symbol at the end of each annotation. Chemical symbols of the elements are used to code metals and alloys. In addition, various materials groups are coded. For example, "EG" plus a lower-case letter refers to an "Element Group," "SG" to "Special Groups," and various combinations of capital letters indicate types of steels and cast irons. For example the symbol "C21" might be followed by the symbol "Cu," written "(C21, Cu)" and

indicating that the reference had to do with smelting of copper alloys. This coding system is explained in detail in the ASM-SLA Metallurgical Literature Classification.

An understanding of this coding system, however, is not essential to the use of this volume of the Review of Metal Literature, which is accompanied by a complete subject index starting on page 761. Since the annotations are classified primarily by processes and properties, the subject index has been prepared with the emphasis primarily on materials. Subheads and cross-references are included in sufficient detail to permit the location of articles on any specific subject related to the metal industry. Indexing is based on the content of the article and not merely on the title.

In using the book, if the primary interest is in the broad field of corrosion, or foundry practice, or heat treatment, turn immediately to the respective section as given in the table of contents. If the main interest is in aluminum alloys, or copper, or cast iron, turn to the corresponding heading in the subject index. If interest lies in specific aspects of foundry practices, or a particular type of heat treatment, these broad processes will be found broken down and subdivided in the subject index. An author index is also provided and a list of addresses of the journals and periodicals from which the literature references are taken.

Preparation of the annotations has been under the direction of Stewart J. Stockett, technical abstractor at Battelle Memorial Institute, assisted by a staff of abstractors, and various members of the translation group at Battelle. The subject index was prepared by Meredith S. Wright.

Marjorie R. Hyslop
Editor

April 1, 1955

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GENERAL METALLURGICAL

1-A. Trend Toward Automation in Automatic Weighing and Bulk Materials Handling. I. H. Richardson. *Mechanical Engineering,* v. 75, Nov. 1953, p. 865-870.

Progress made by specific companies in variety of industries toward fully automatic operation. Photographs, diagram. (A5)

2-A. Larger Zinc Supply Predicted for Die Casters at Prices Tending to Fluctuate Less Violently. Simon D. Strauss. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Oct. 1953, p. 7, 19.

Reports industry's interest is best served by profitable price for miners and smelters. (A4, Zn)

3-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 20, Oct. 1953, p. 447-454.

From "iron" to "joints". Photographs, diagrams, tables, graphs. (To be continued.) (A10)

4-A. Conservation of Manganese. *Mining Journal,* v. 241, Oct. 16, 1953, p. 440-441.

Précis of various official reports on subject of manganese conservation. Possible methods of economy in use of manganese resources. (A8, B10, Mg)

5-A. Automation Increases Production of Stampings at Oldsmobile. Charles H. Wick. *Machinery,* v. 60, Nov. 1953, p. 202-209.

Mechanisms for automatically loading, unloading and transferring hoods, bumpers and other large stampings have increased productivity and greatly improved safety conditions. Photographs, diagrams. (A5, G3)

6-A. The British Iron and Steel Research Association. *Metallurgia,* v. 48, no. 288, Oct. 1953, p. 178-180.

Research on conservation and recovery of such materials as zinc and sulphuric acid, continuous measurement of strip gage during rolling, inspection of wire dies and improved crane controller layouts. Photographs. (A9, A8, S14, S18, Fe, ST)

7-A. Handling Adaptations in a Press Shop. *Mechanical Handling,* v. 40, Nov. 1953, p. 526-527.

Increased efficiency through adaptations in materials handling equipment. Photographs. (A5, G1)

8-A. A New Method of Handling and Storing Small Components. L. J. Hoefkens. *Mechanical Handling,* v. 40, Nov. 1953, p. 535-542.

Method and control systems. Photographs. (A5)

9-A. Latin-American Steel—Present Position and Future Possibilities. *Metallurgia,* v. 48, no. 288, Oct. 1953, p. 159-164.

Although iron ore, manpower and wage positions are favorable to development of native iron and steel industries, lack of capital and scarcity of coking coal are serious drawbacks. Particulars of ore, coal, electricity and steel positions in seven of these countries. Tables. (A4, ST)

10-A. The British Cast Iron Research Association. J. G. Pearce. *Metallurgia,* v. 48, no. 288, Oct. 1953, p. 175-177.

Elimination of health hazards in foundry, including improved grinding wheel dust extractor unit and other research projects. Diagram, photograph. 9 ref. (A7, E general, CI)

11-A. The British Non-Ferrous Metals Research Association. E. C. Mantle. *Metallurgia,* v. 48, no. 288, Oct. 1953, p. 183-186.

Research on copper, nickel, aluminum, magnesium, lead and tin, and their alloys; zinc and galvanizing; and chemical and electrochemical finishes. Photographs. 26 ref. (A9, L general, Cu, Ni, Al, Mg, Pb, Sn, Zn)

12-A. The Recovery of Zinc From Galvanizers' Dross. M. L. Hughes and R. Humphreys. *Sheet Metal Industries,* v. 30, no. 319, Nov. 1953, p. 955-966, 968.

Sources of dross, amount produced under various conditions and methods employed for recovery of zinc. Tables, micrographs. 20 ref. (A8, Zn)

13-A. Materials Handling at Steelworks Coke Ovens. *Coke and Gas,* v. 15, Nov. 1953, p. 415-420.

Description of handling systems used in blending and in bringing together raw materials of ironmaking process. Photographs. 3 ref. (A5)

14-A. The Electrochemical and Electrometallurgical Industries of Canada. V. G. Bartram. *Electrochemical Society, Journal,* v. 100, Nov. 1953, p. 295c-302c.

Present industrial expansion and future opportunities. Tables, photographs. (A4)

15-A. Current Russian Metallurgical Texts. III. Carl Andrew Zapffe. *Metal Progress,* v. 64, Dec. 1953, p. 88-90.

Presents reviews of five books published in the Soviet Union from 1947 to 1951. "Introduction to Metallurgy", G. I. Pogodin-Alekseev, Y. A. Geller and A. G. Rakhshsadt; "Metals and Alloys in Chemical Machine and Apparatus Construction", D. O. Slavin and E. B. Shteiman; "Corrosion of Chemical Apparatus and Corrosion Resistant Materials", I. Ya. Klinov; "The Metallurgy of Copper and Nickel", V. I. Smirnov; and "Rare Metals", O. A. Songina. (A general)

16-A. Flow-Through Treatment of Metal Industry Wastes. Frank J. Hendel and V. T. Stewart. *Sewage and Industrial Wastes,* v. 25, Nov. 1953, p. 1323-1330.

Process using automatic equipment for neutralization of acids by lime or soda; reduction of chromium by sulfur dioxide; and oxidation of cyanides by chlorine. Photographs, tables. 7 ref. (A8)

17-A. (Book.) **The Aluminum Industry.** Stanley V. Malcuit. 36 p. 1953. Bellman Publishing Co., 83 Newbury St., Boston 16, Mass. $1.00.

General discussion of the industry for purpose of assisting individual in choice of a career. Personal qualifications required, scholastic training, salary scale, chances for advancement, advantages and disadvantages, and possibilities for both men and women. (A6, Al)

18-A. (Book.) **Engineering Metallurgy.** Bradley Stoughton, 4th Rev. Ed. Allison Butts and Ardrey M. Bounds. 479 p. 1953. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. $7.50.

Metals as materials of construction; sources of metals; sizing and shaping metallic bodies; welding and joining metallic bodies; metallurgical inspection and testing; theory of alloys; heat treatment of metals and alloys; properties and uses of iron, steel, and nonferrous metals; examples of application of metals in engineering service; corrosion and its prevention; producing and refining iron, steel, and nonferrous metals; furnaces, refractories, and fuels; and measurement of temperature in industrial operations. (A general)

19-A. (Book.) **Handbook of Material Trade Names.** O. T. Zimmerman and Irvin Lavine. 704 p. 1953. Industrial Research Service, Dover, N. H. $20.00.

An alphabetical list of 15,000 tradenames of commercial materials including metals, plastics, chemicals, and pharmaceuticals. Compositions, properties, and names and addresses of manufacturers or distributors are listed. (A10)

20-A. (Book.) **Productivity in the Light Flat-Rolled Segment of the Steel Industry.** T. F. Walsh. Fordham University, New York 58, N. Y.

Comprehensive analysis of productivity in the strip mill. Reasons for increased productivity. (A4, A6, F23)

21-A. (Book—German.) **(Iron & Steel Handbook) Werkstoff-Handbuch Stahl und Eisen.** Ed. 3. 748 p. 1953. Verlag Stahleisen m.b.H., Düsseldorf, Germany. DM 78.

General discussion of iron and steel technology. Properties and testing, composition and production of various types, special applications, and treatment and testing methods. (A general, CI, ST)

22-A. How to Promote Safety in the Foundry. *Canadian Metals,* v. 16, Dec. 1953, p. 26-27, 30.

How a foundry slashed accident rates by an intelligently planned and coordinated effort on the part of all from management to worker. Photographs. (A7, E general)

23-A. B.I.S.R.A. Laboratories at Sheffield. *Engineer,* v. 196, Nov. 27, 1953, p. 694-697.

Equipment for studying the making, working and metallurgy of steel. Photographs. (A9, ST)

24-A. Sheffield Laboratories of British Iron & Steel Research Association. *Engineering,* v. 176, Nov. 27, 1953, p. 683-685, 688.

Laboratory facilities including cold strip-rolling mill, hydraulic

forging press, wiredrawing machine, melting furnaces and testing equipment. Photographs.
(A9, D general, F general, ST)

25-A. Practical Learning Curves Improve Shop Performance. C. T. Dennington. *Iron Age,* v. 172, Nov. 26, 1953, p. 108-111.
Charts to make mathematical concepts of time studies and estimates more meaningful to shop personnel. Graphs. (A5, A6)

26-A. Joint Effort Promotes Safety in Welding. N. I. Sax. *Iron Age,* v. 172, Dec. 10, 1953, p. 177-180.
Fire and accident prevention; health protection and safety standards for equipment. 9 ref.
(A7, K general)

27-A. Review of the Major Plant and Equipment Installed in the Sheffield Laboratories. *Metal Treatment and Drop Forging,* v. 20, Nov. 1953, p. 498-504.
Melting facilities and metalworking research unit. Photographs.
(A9, ST)

28-A. Nonferrous Metal Industries in Yugoslavia. Joseph Zimmerman. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Nov. 1953, p. 7-9, 19.
Statistics on production and consumption. Tables.
(A4, Pb, Sb, Zn, EG-a)

29-A. The Light Metals Market. *Modern Metals,* v. 9, Nov. 1953, p. 85-87.
Tabulation by states of producers, fabricators, foundries, die casters, and product manufacturers for Al, Mg, and Ti. (A10, Al, Mg, Ti)

30-A. (German.) **Dust Problems in Steel Plants.** Kurt Guthmann. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1512-1524.
Dust separation, precipitation difficulties and grain size. Dust removal and separating plants and their efficiencies. Tables, graphs, diagrams, photographs. 37 ref. (A8)

31-A. Metallurgical Activities in Japan. Daniel J. Murphy. *Metal Progress,* v. 65, Jan. 1954, p. 67-71.
Reviews past and present research activities in refining, casting and testing ferrous and nonferrous metals and alloys. Photographs. (A9)

32-A. British Advances in Metals, Fabrication Methods and Applications. Tom Bishop. *Metal Progress,* v. 65, Jan. 1954, p. 101-104, 188, 190.
Brief review of activities in 1953 including: a new alloy steel; a new nickel alloy—"Nimonic 95"; corrosion of copper and its alloys; development of a new series of Cu-Mn-Sn alloys; installation of an interplanetary rolling mill; studies of wiredrawing techniques; and development of cast milling cutters. Photographs, diagram, table.
(A general, AY, Ni, Cu, CN)

33-A. B.I.S.R.A. Sheffield Laboratories. The Main Equipment. *British Steelmaker,* v. 19, Dec. 1953, p. 716-721, 723-724.
Electric arc furnace, four-high rolling mill, 200-ton forging press, wire drawing machine and equipment for high-frequency melting, vacuum fusion gas analyses and fatigue testing. Photographs. (A9)

34-A. Touch and Go in Nickel for Civilian Consumers. *Steel,* v. 133, Dec. 28, 1953, p. 27-28.
Nickel users are in for another siege of shortage unless the government revamps its present stockpile schedules. Photographs. (A4, Ni)

35-A. Shake-Up in World Trade Coming. *Steel,* v. 133, Dec. 28, 1953, p. 38-39.
War-induced shortages of steel disappeared in 1953; new world trade patterns, held back by emergency conditions, are now free to form. Competition will be intense. (A4, ST)

36-A. New Alloy. Boost to Turbines Relief for Stockpile. Allen G. Gray. *Steel,* v. 133, Dec. 28, 1953, p. 68-70.
Nickel content of 16-25-6 alloy was reduced 40%, high-temperature properties are as good as ever and ductility is better than ever. Photographs, micrographs, tables.
(A4, Q general, SS)

37-A. 1954 Metalworking Facts and Figures. *Steel,* v. 134, Jan. 4, 1954, p. 157-204.
Statistics on production of goods, labor, prices, earnings, etc. Tables. graphs. (A4)

38-A. Steel's Forum on Technical Progress. *Steel,* v. 134, Jan. 4, 1954, 130 p.
Brief remarks by 321 executives of metalworking plants on steelmaking; nonferrous metal production; casting; materials and metallurgy; heat treating; inspection and testing; drives and controls; machining, tooling and gaging; forming; cleaning and finishing; joining and assembly; handling and packaging; lubrication; and service and maintenance. (A general)

39-A. Industrial Noise. Sound Control Panels Quiet Machines to Hike Worker Output. Cloyd Smith. *Western Metals,* v. 11, Dec. 1953, p. 52-54.
Sound-proof enclosures for equipment. Photographs. (A5)

40-A. (Book.) **Basic Engineering Metallurgy.** Carl A. Keyser. MacDonald and Co., Ltd., 43 Ludgate Hill, London E.C.4, England. 60s.

Theoretical physical metallurgy; steels; alloys; mechanical tests; powder metallurgy; electroplating and electroforming; machining and finishing; casting; and joining. (A general)

41-A. (Book.) **Fundamentals of Physical Metallurgy.** Ralph Hultgren. 395 p. Macdonald & Co., Ltd., 43 Ludgate Hill, London E.C.4, England. 70s.

A wide field is covered in broad outline. Omissions noted are shell molding and continuous casting. (A general)

42-A. (Book.) **Review of A.S.T.M. Research.** 22 p. 1953. American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa. No charge.

Work of A.S.T.M. committees on electrodeposited metallic coatings; paint, varnish, lacquer and related products; porcelain enamel; corrosion of iron, steel and nonferrous metals and alloys; and on light metals and alloys. (A9, L general, R general)

43-A. (Book.) **Saving Scarce Materials, PB 106425.** *(Bibliography of Technical Reports,* v. 17, no. 5, p. 197.) Anglo-American Council on Productivity. 33 p. Nov. 1951. Available from OTS, U. S. Dept. of Commerce, Washington 25, D. C. $0.50.

Reports on ferrous, nonferrous and light metal alloys; rare metals; and scarce alloying materials. Successful economy measures to save scarce metals; data showing substantial reductions in use of scarce alloying elements. Tables. (A4, ST, Ni, Cr, Mn, Mo, W)

44-A. Coming Changes in Iron and Steel. Clarence E. Sims. *Battelle Technical Review,* v. 3, Jan. 1954, p. 7-8.

Iron and steel industry will lean heavily on technology to insure receipt by the nation of greater quantities of iron and steel at low cost. (A4, CI, ST)

45-A. Metallurgy. H. A. Holden. *Chemical & Process Engineering,* v. 34, Dec. 1953, p. 384-387.

Rare earth and boron alloy steels and methods of their corrosion protection and cold working. Magnesium, titanium, zirconium, molybdenum, vanadium and other rare metals. Photographs, table. 105 ref. (A general)

46-A. Space Control in a Modern Factory. *Engineers' Digest,* v. 14, Dec. 1953, p. 454-456.

Consideration of rate of production, production potential and type of product as basis for space control. Photographs. (A5)

47-A. Business Roundup. *Iron Age,* v. 173, Jan. 7, 1954, p. 302-305.

Forecasts business trends for 1954. Diagram, table. (A4, ST, Al, Cu, Ni, Pb, Zn)

48-A. Metals & Materials. *Iron Age,* v. 173, Jan. 7, 1954, p. 306-313.

Reviews 1953 and forecasts 1954 markets. Graphs, diagram, photographs, tables. 6 ref. (A4)

49-A. Production Processes. *Iron Age,* v. 173, Jan. 7, 1954, p. 314-342.

Outstanding developments in metalworking processes during 1953 and significant production trends for 1954. Photographs, graphs, diagram. 55 ref. (A5, A4)

50-A. Handbook of Terms Commonly Used in the Nonferrous Industries. *Iron Age,* v. 173, Jan. 7, 1954, p. 343-344, 348, 351-354, 356-364, 366, 369-382.

Aluminum, copper and brass and magnesium fields. (A10, Al, Cu, Mg)

51-A. Price and Production Data. *Iron Age,* v. 173, Jan. 7, 1954, p. 405-420.

Steel industry, nonferrous, pig iron, ore, ferro-alloys and iron and steel scrap. Tables. (A4)

52-A. Application of Research to an Industry Composed of Small Firms. C. N. Kington. *Metal Treatment and Drop Forging,* v 20, Dec. 1953, p. 597-603.

Means to overcome financial, technical and human problems in small firm research. (A9)

53-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 20, Dec. 1953, p. 604-610.

From "jolly" to "kink". Drawings, tables, graphs, photograph. (A10)

54-A. Toxicity of Beryllium. Carl S. Pomelee. *Sewage and Industrial Wastes,* v. 25, Dec. 1953, p. 1424-1428.

Problems in handling of waste materials and their disposal. (A8, A7, Be)

55-A. Stop Oxyacetylene Fires. Carl Saacke and R. L. Deily. *Welding Engineer,* v. 39, Jan. 1954, p. 22-25.

Condensation of paper at 41st National Safety Congress, Chicago, Oct. 1953. Safety rules and their importance. Graph, diagrams, photograph. (A7, K2)

56-A. New B.I.S.R.A. Laboratories Opened in Sheffield. *Wire Industry,* v. 20, Dec. 1953, p. 1185-1186.

Facilities, including metalworking shop, wire drawing machine, rolling mill and fatigue testing machines. Photographs. (A9, F general, ST)

57-A. (English.) **Modern Conception of Ware House of Special Steels.** *Aciers Fins & Spéciaux Francais,* 1953, no. 13, Mar., p. 45-50.

Organization of depots for sale of special steels in Paris. Photographs. (A5, ST)

58-A. (Hungarian.) **Safety Measures During Magnesium Processing.** Gyula Emod. *Aluminium (Budapest),* v. 5, no. 13, Mar., p. 45-50.

Safety measures necessary in the storage room. Extinguishing of fires and safety measures during cutting, machining and casting. 7 ref. (A7, E general, G17, Mg)

59-A. (Hungarian.) **Utilization of Salt Residues and Scrapings Arising During the Processing of Light Metals and Light Metal Scrap.** Andras Domony. *Aluminium (Budapest),* v. 5, no. 12, Dec. 1953, p. 245-247.

Investigations to determine quantity of valuable materials lost in salt residues and scrapings. Proposes method for recovery. Composition of waste material. Tables. (A8, Al)

60-A. (Hungarian.) **Management of Electric Power in Metallurgy.** Béla Havas. *Kohaszati Lapok,* v. 8, no. 12, Dec. 1953, p. 260-263.

Formulates and discusses basic principles for an economical management of electric power. Optimum exploitation of power plants, proper application of power and continuous production. Tables. (A5)

61-A. Recovery of Manganese in Steel Mill Operations. E. C. Wright. *American Iron and Steel Institute, Preprint,* Oct. 21, 1953, 23 p.

Paper presented at Birmingham Regional Technical Meeting of AISI, Oct. 21, 1953. Diagrams, tables. (A8, Mn, ST)

62-A. The Use of Steel Plant Byproducts. E. H. Rose and J. Forrest Kimball. *American Iron and Steel Institute, Preprint,* Oct. 21, 1953, 14 p.

Paper presented at the Birmingham Regional Technical Meeting of AISI, Oct. 21, 1953. (A8)

63-A. Iron, Steel and American History. E. N. Hartley. *American Iron and Steel Institute, Preprint,* 1953, 17 p.

Paper presented at 1953 Regional Technical Meeting of AISI, Youngstown, Chicago, Birmingham, San Francisco and Philadelphia. Sections on rise and fall of ironworks; restoration begins; hammersmith was prototype; similarity to modern enterprise; ironworks affected society; industry was a catalyst; economic facts of life; push toward innovation; industry as a frontier; working for the good of all; standard of living improved; industrial history skimped; opportunity at hand; and industry is basic. (A2)

64-A. The Two-Stage Process for the Recovery of Manganese From Open Hearth Slag. A Full Scale Production Trial. H. W. Hosking and J. A. Gregory. *Australasian Engineer,* 1953, Dec., p. 48-57.

Data were acquired and more satisfactory application foreshadowed. Photographs, tables. 3 ref. (A8, B21, Mn)

65-A. Over Thirty-Two Million Tons of Purchased Scrap Consumed in 1953. Edwin C. Barringer. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 43-44.

Supply and demand discussed. Photograph. (A8, A4)

66-A. British Iron and Steel Industry. II. *Engineer,* v. 197, Jan. 8, 1954, p. 66-68.

Includes photographs. (A4, Fe, ST)

67-A. Retrospect and Prospect. II. Raw Materials. *Engineering,* v. 177, Jan. 8, 1954, p. 42-44.

Trends in nonferrous metals; new applications of aluminum; price of iron and steel in Britain; future demand for steel; and steel abroad. Graphs. (To be continued.) (A4, Al, Fe, ST)

68-A. From Raw Material to Finished Product. I. James M. Leake. *Finish,* v. 11, Jan. 1954, p. 25-27.

Early iron smelting practices, use of precious metals and bronze in Biblical times, later developments through Middle Ages and the Renaissance and effects of industrial revolution. Photographs. (A2)

69-A. Business Roundup. *Fortune,* v. 49, Feb. 1954, p. 25-26, 28, 30, 32.

Report on the economic outlook. Graphs. (A4)

70-A. Modern Scrap Yard Keeps Pace With Market. J. B. Schlossberg. *Iron Age,* v. 173, Jan. 14, 1954, p. 118-121.

Use of automatic controls on machinery, safety measures and public address system for efficiency. Photographs, diagram. (A8, A5)

71-A. Annual Materials Engineering Review and Forecast. T. C. DuMond. *Materials & Methods* v. 39, Jan. 1954, p. 111-126.

Appraisal of the past year's developments in engineering materials reveals some changes in use of materials that probably will be forthcoming in 1954. Photographs. (A4)

72-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 21, Jan. 1954, p. 29-34.

From "kindling temperature" to "laterite." (To be continued.) (A10)

73-A. The New Radiometallurgy Laboratory at Hanford. *Nucleonics,* v. 12, Jan. 1954, p. 26-27.

Structure which provides complete facilities for metallurgical studies of irradiated metals. Photographs, diagrams. (A9, S19)

74-A. Fly Ash From Power Plants May Yield Commercial Germanium. *Power Engineering,* v. 58, Jan. 1954, p. 65.

Results of studies of 13 boiler installations in six power plants may indicate large scale source of element. (A8, Ge)

76-A. Materials Handling in the Warehouse. *Screw Machine Engineering,* v. 15, Jan. 1954, p. 43-45.

Equipment and handling processes. Photographs. (A5)

77-A. Review of Literature on Health Hazards of Metals. I. Copper. Sara J. Davenport. *U. S. Bureau of Mines, Information Circular* 7666, Nov. 1953, 114 p.

Voluminous data available for publication by Bureau of Mines revised and brought up to date. 230 ref. (A7, Cu)

78-A. New Methods of Illumination in the Wire Industry. Friedrich Baierl. *Draht (English Ed.),* 1953, no. 17, Dec., p. 39-40.

Basic requirements for good illumination and suggestions for arrangement of suitable lighting installations in work rooms. Tables. (A5, F28)

79-A. Work Simplification Saves $300 000 in Six Years. W. S. Williams. *American Foundryman,* v. 25, Feb. 1954, p. 54-57.

Work simplification and training of employees to develop methods of doing work in the most simple way have saved Lynchburg Foundry Co. $300,000 in six years. Photographs. (A5)

80-A. Developments in the Iron and Steel Industry During 1953. I. E. Madsen. *Iron and Steel Engineer,* v. 31, Jan. 1954, p. 120-158.

Production, expansion, foreign plants, raw material supplies, improvements in melting and rolling, controls, materials handling and mechanical and electrical equipment. Photographs, diagrams, graph, table. (A general, D general, F general, ST, CI)

81-A. The Industry in the World Today. *Light Metals,* v. 17, Jan. 1954, p. 25-26.

Special problems which the Italian light-metals industry is encountering. Production and application. Tables. (To be concluded.) (A general, T general, Al)

82-A. Metals, Minerals and Alloys. *Mining Journal,* v. 242, Jan. 15, 1954, p. 76-77.

Market conditions for copper, lead, tin, zinc, nickel and manganese. (A4, Cu, Pb, Sn, Zn, Ni, Mn)

83-A. Birth of an Industry. Arthur C. Bining. *Steelways,* v. 10, Feb. 1954, p. 12-15.

Development of steelmaking from primitive times to the seventeenth century. Diagrams. (A2, ST)

84-A. (French.) **What Will Be Happening in 1962?** G. A. Baudart. *Revue de l'Aluminium,* v. 30, no. 205, Dec. 1953, p. 427-429.

Shows that consumption of aluminum has doubled every ten years. Possibilities of achieving balance between European and African resources and demand. (A4, B10, Al)

85-A. (Book) **Engineering Alloys. Names, Properties, Uses. 3rd Ed.** Norman E. Woldman. 1034 p. 1954. American Society for Metals, 7301 Euclid Ave., Cleveland, Ohio. $15.00.

Practical and technical reference book on engineering alloys. Sections include alloy index and data; directory of manufacturers and their alloys; key index to manufacturers; and a useful data appendix. (A10)

86-A. (Book.) **The First Iron Works Restoration.** 30 p. 1953. American Iron and Steel Institute, 350 Fifth Ave., New York 1, N. Y. $0.25.

Work leading to the faithful and authentic reproduction of one of America's earliest industrial landmarks, the first iron works at Saugus, Mass. (A2, Fe)

87-A. (Book.) **The Growth of the Major Steel Companies, 1900-1950.** Gertrude G. Schroeder. 244 p. 1953. Johns Hopkins Press, Baltimore.

A statistical picture of the absolute and relative growth of the various companies. (A4, ST)

88-A. (Book.) **An Outline of the Development of the George Fischer Works.** 23 p. 1950. George Fischer, Ltd., Schaffhausen, Switzerland.

History of the George Fischer Iron and Steel Works, from its founding in 1802 to the present time. (A5, D general, ST)

89-A. Correlation of Metallurgy With Engineering Design. R. C. Gibbons. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 10 p.

Discussion on strength of alloys, rigidity, machinability and basic metal-forming processes. Photographs, drawings. (A general, Q general, G general)

90-A. Metals. *Engineering and Mining Journal,* v. 155, Feb. 1954, p. 72-91, 134, 136, 138.
Includes "Gold", M. A. Kriz; "Silver", Francis H. Wemple; "Copper", H. H. Wanders; "Lead", Robert L. Ziegfeld; "Zinc", Charles R. Ince; "Uranium", Donald L. Everhart; "Titanium", Alfred F. Tumin; "Aluminum", Irving Lipkowitz; "Magnesium", J. D. Hanawalt; and "Tin", H. H. Wanders. Graphs, tables, maps. (A general, Au, Ag, Cu, Pb, Zn, U, Ti, Al, Mg, Sn)

91-A. Minor Metals. Charles White Merrill. *Engineering and Mining Journal,* v. 155, Feb. 1954, p. 92-96, 133.
Includes "Antimony", Abbott Renick; "Beryllium", Robert F. Griffith; "Mercury", Helena M. Meyer; "Arsenic", Abbott Renick; "Bismuth", Abbott Renick; "Cadmium", Robert L. Mentch; and "Platinum Group", James E. Bell. Tables, diagrams. (A general, Sb, Be, Hg, As, Bi, Cd, Pt)

92-A. Ferro-Alloy Metals, Norwood B. Melcher. *Engineering and Mining Journal,* v. 155, Feb. 1954, p. 97-102.
Includes "Tungsten", Robert W. Geehan; "Molybdenum", Robert W. Geehan; "Manganese", Gilbert L. DeHuff, Jr.; "Cobalt", Hubert W. Davis; "Nickel", Hubert W. Davis; and "Chromium", Charles Katlin. Tables. (A general, W, Mo, Mn, Co, Ni, Cr, Fe-n)

93-A. Still More Steel Expansion Coming as the Population Climbs; 1953's 6.8-Million-Ton Gain Is Just One Step Along the Way. *Steel,* v. 134, Feb. 8, 1954, p. 78-79.
Data sheet of steelmaking capacity. (A4, D general, ST)

94-A. (Czech.) **Economic Control of Alloyed Steel Manufacture. V.** Keclik. *Hutnické Listy,* v. 9, no. 1, Jan. 1954, p. 24-32.
Comparison of basic melting methods. Shows expenditures for melting steel from cold charged metal in various furnaces. Tables. 8 ref. (A4, D general, AY)

95-A. Dust Control. *Iron & Steel,* v. 27, Feb. 1954, p. 42.
Reports BCIRA model extractor now available. Design, construction and applications. Drawing. (A5)

96-A. Magnesium in Britain—1954 and the Future. C. J. P. Ball. *Light Metals,* v. 17, Feb. 1954, p. 42-43.
English efforts to achieve production of low-cost magnesium products. Compares progress with that of the U. S. Graph. (A4, Mg)

97-A. Contribution of Industrial Metrology and High Precision Mechanics to the Elimination of Scrap. *Microtecnic (English Ed.),* v. 7, no. 6, 1953, p. 273-366.
Consists of "The Works Manager and the Problem of Scrap", André Léauté; "The Engineer and the Problem of Scrap", P. Nicolau; "The User's Point of View", Raison and Chapon; "The Manufacturer's Point of View", R. Masse and Maugras; "The Contribution of Copying to Precision Turning", Le Lan; "Recent Progress in Centreless Grinding", W. Loewe; "Inspection, the Guardian of Quality", G. Langendorff; "Automatic Inspection as a Means of Reducing Costs and Improving Quality", Romano; "Metrology Associated With the Machine Tool", Yribarren; "Results Obtained by Using Gauging Instruments of the Sonic Flow Type on Machine Tools", A. Fortier. Tables, photographs, graphs, diagrams. (A8)

98-A. World Trends in Iron and Steel Industry. *South African Mining and Engineering Journal,* v. 64, pt. 2, Dec. 26, 1953, p. 631, 633.
Changes in industry from 1929 to 1952, growing output and increased use of scrap. Tables. (A4, ST)

99-A. The Search for New Alloys. G. L. Bailey. *Times Review of Industry (Supplement),* 1954, p. 35-36, 39.
Nonferrous metals are in greater demand than ever before to meet changing requirements of modern engineering and manufacturing methods. Photographs. (A general)

100-A. (Dutch.) **The Industrial Electric Furnace. An Outline of the Forms of Development of Importance to Dutch Industry.** J. J. M. Roos. *Smit Mededelingen,* v. 8, no. 4, Oct.-Dec. 1953, p. 122-137.
Resistance, induction, di-electric and electric-arc heating. Photographs. (A general, J general)

101-A. Growth Possibilities of Electric Furnace Carbon Steel. Willard C. Wheeler. *Iron and Steel Engineer,* v. 31, Feb. 1954, p. 85-92; disc., p. 92-94.
Attempts to predict future increases in production based on past performance of other industries. Graphs. (A4, ST, AY)

102-A. Kaiser Steel Corporation's Fontana Plant. T. J. Ess. *Iron and Steel Engineer,* v. 31, Feb. 1954, p. K1-K20.
Raw materials, coke ovens, blast and openhearth furnaces, blooming, structural, plate and strip, tinplate, skelp and merchant and pipe mills and cold reduction facilities. Plant layout, diagrams, photographs, tables. (A5, D general, F general, ST)

103-A. Norway's Metal Industries. *Metal Age,* 1954, no. 26, Feb., p. 3-6.

Production of ferro-alloys, aluminum, copper, nickel and zinc. Map, table. (A4, AY, Al, Cu, Ni, Zn)

104-A. Zinc Industry Cannot Afford to be Complacent About Present Market Demand for Its Products. R. G. Kenly. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Feb. 1954, p. 7-8, 19.

Metal's use in rubber, paint, brass, die casting and galvanizing fields may decline somewhat in 1954 but will stay at high levels. (A4, Zn)

105-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 21, Feb. 1954, p. 83-90.

From "lattens" to "Lipowitz's alloys". Diagrams, tables. (To be continued.) (A10)

106-A. Copper Consumption Rate Is Well Maintained in U. K. and Europe; Consumers' Stocks Not Large. L. H. Tarring. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Feb. 1954, p. 12-13.

Economic outlook for British metal market. (A4, Cu)

107-A. U. S. Copper Output Curtailed as Demand Eases While Zinc and Lead Production Drops Further. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Feb. 1954, p. 15-16, 19.

Economic trends in domestic metal industries. (A4, Cu, Zn, Pb)

108-A. Stable Silver Price Anticipated During 1954; Users Will Be More Dependent on New Sources. Handy & Harmon. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Feb. 1954, p. 9-11, 19. (Excerpts from 38th Annual Review of Silver Market, 1953. Handy & Harmon, New York, N. Y.)

Economic outlook for silver industry. Tables. (A4, Ag)

109-A. Metals, Minerals and Alloys. *Mining Journal,* v. 242, Feb. 12, 1954, p. 185-186.

Economic position of various metals and their production tendencies. Table. (A4, Fe, Ti, Mg, Al, Zn, Pb, Cu)

110-A. Nonferrous Metals. *Steel,* v. 134, Mar. 1, 1954, p. 154.

Economic discussion on competition of imported brass with local sources. (A4, Cu)

111-A. (Hungarian.) **Electric Gas Cleaning.** Karoly Horvath. *Elektrotechnika,* v. 47, no. 1, Jan. 1954, p. 21-28.

Principles of operation and construction. Dust cleaners for powder stations, coal dust separators, generator gas cleaners and cleaning plants for cement factories and metallurgical works. Diagrams, graphs, tables. (A5, A8)

112-A. (Book.) **Conference on Nuclear Engineering, 1953, Proceedings.** Sections individually paged. Sept. 9-11, 1953. Univ. of Calif., Berkeley, Calif. $7.50.

A high-level technical program of contributed, unclassified, and declassified papers for persons concerned with beneficial applications of atomic energy. (A general)

113-A. (Book—German.) **(Textbook on General Metallurgy.) Lehrbuch der Allgemeinen Metallkunde.** Georg Masing. 620 p. 1950. Springer-Verlag, Berlin, Germany.

General principles; constitution theory; atomic structure of metallic crystals; diffusion; formation of crystalline metals; physical properties of metals; plastic deformation; internal stresses; recovery and recrystallization; phase changes in crystalline metals; and chemical reactivity of metals with nonmetallic substances. (A general, M general, N general)

114-A. Ultrasonic Flue Dust Elimination. H. Manley. *Engineer,* v. 197, Feb. 19, 1954, p. 291.

•Use of siren to get high intensity and power levels for particle elimination. Photograph, diagram, graph. 10 ref. (A8)

115-A. Scrap Handling Speeded With Automatic Shear-Baler. W. G. Patton. *Iron Age,* v. 173, Mar. 18, 1954, p. 143-145.

Equipment and performance characteristics. Photographs. (A8, A5)

116-A. Metallurgical Education in the United States. Alfred Bornemann. *Metal Progress,* v. 65, Mar. 1954, p. 97-100.

Analysis of educational facilities and processes through which technically trained personnel are prepared. Tables, photograph. (A3)

117-A. Recovery of Metal Alloys. *Railway Gazette,* v. 100, Feb. 19, 1954, p. 213.

Rotary furnace incorporating a bottle-shaped crucible for melting swarf. Photograph. (A8)

118-A. Treatment of Complex Metal-Finishing Wastes. K. S. Watson. *Sewage and Industrial Wastes,* v. 26, Feb. 1954, p. 182-194; disc., p. 194-196.

Collection system, treatment plant and cost of constructing and operating these facilities. Photographs, tables, diagram. (A8)

119-A. Chromic Acid Recovery by Ion Exchange. R. J. Brink. *Sewage and Industrial Wastes,* v. 26, Feb. 1954, p. 197-202.

Equipment and operating procedures of installation for removing chromic acid from anodizing rinse water. Photograph, tables, diagrams. (A8, L19)

120-A. (German.) **Examples of New Developments in Metallurgy on the Basis of Chemical Research.** H. Schackmann. *Chemie-Ingenieure-Technik,* v. 26, no. 2, Feb. 1954, p. 65-72.

Influence of pure chemistry upon metallurgy explained on basis of numerous examples. Graphs, diagrams, photographs, table. 16 ref. (A general)

121-A. (German.) **Deposits of Coal, Iron, Petroleum and Uranium in the World.** Werner Hagen. *Glückauf,* v. 90, nos. 1-2, Jan. 2, 1954, p. 1-31.

Review of output in various countries. Tables, map. 37 ref. (A4, B10, Fe, U, Au)

122-A. Engineered Scrap Service Cuts Costs, Raises Profits. Julian Grombacher. *Iron Age,* v. 173, Mar. 4, 1954, p. 166-168.

Faster handling and better segregation of scrap gives industrial plants maximum price per scrap unit. Photographs. (A8)

123-A. Disposal of Cyanide Wastes From Plating Operations. Barnett F. Dodge, Charles A. Walker and Walter Zabban. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529, p. 113-119; disc., p. 119-120.

Eight methods investigated. Graphs. 8 ref. (A8, L17)

124-A. Primary Aluminum Output in 1954 Estimated at 1,400,000 Tons, Eight Times More Than in 1939. Martin L. Tressel. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Mar. 1954, p. 9-11.

Supply sufficient to satisfy growing civilian requirements; price of metal compared with steel now much more favorable. Diagrams, charts. (A4, Al)

125-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 21, Mar. 1954, p. 115-122.

From "liquation" to "magnet". Tables, graph, diagrams, photograph. (To be continued.) (A10)

126-A. Disposal of Steel Production Wastes at the Fairless Works. G. A. Howell. *Sewage and Industrial Wastes,* v. 26, Mar. 1954, p. 286-297; disc., p. 297-299.

Waste waters containing mill scale, acids, flue dust and concentrations of oils and greases are treated close to their sources. Photographs, diagrams. (A8)

127-A. Resources-Research-Rewards. D. D. Morris. *Western Miner and Oil Review,* v. 27, Mar. 1954, p. 40-44.

Effects of research on mining and metallurgical industries. Economic results of development of new processes in mining and extraction of lead, iron and zinc. Charts. (A9, A4, B general, Fe, Pb, Zn)

128-A. (Pamphlet.) **Abstracting and Indexing Sources for Literature on Metals and Metal Fabrication.** Ellis Mount. Bibliography no. 2, 24 p. 1953. John Crerar Library, 86 East Randolph St., Chicago 1, Ill.

Selective list of 45 current indexing and abstracting services. 3 ref. (A10)

129-A. (Book.) **Iron and Steel Industries of the South.** H. H. Chapman. 427 p. 1953. University of Alabama, Birmingham, Ala. $7.50.

Natural resources; location of mines and plants; coal mining and preparation; raw material costs and wages; markets; economic characteristics; trends and potentials. (A4, B general, Fe, ST)

130-A. (Book.) **Materials and Processes.** James F. Young. 2nd Ed. 1074 p. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $8.50.

Engineering fundamentals of materials and processes as they apply to design, production, and control of products. Metallic and nonmetallic materials in manufacturing processes. (A general)

131-A. (Book.) **Tin, 1951-1953. Review of World Tin Industry.** 100 p. 1953. International Tin Study Group, The Hague, Holland. $1.00.

International position in tin; world production, consumption, smelters, trade, stocks, and prices; and use of tin and tin plate. (A4, Sn)

132-A. Effective Use of Materials. F. Nixon. *Aircraft Production,* v. 16, Apr. 1954, p. 157-164.

Viewpoints, processes and other factors influencing economics of production. Photographs, chart, table. (A4, T24)

133-A. Gas Turbines for the Steel Industry. George H. Krapf. *Blast Furnace and Steel Plant,* v. 42, Apr. 1954, p. 444-447, 450.

New era gives promise of lower operating and investment costs, lower area and water requirements and simplicity of operation. Diagrams, graph. (A5, D general)

134-A. Briquetting Cast-Iron Swarf for Re-Melting. *Engineering,* v. 177, Mar. 26, 1954, p. 414.

A 400-ton automatic hydraulic press capable of converting cast iron swarf into high-density briquettes, suitable for direct remelting, at a rapid and constant rate. Photograph. (A8, CI)

135-A. Metalworking's Future Markets. *Iron Age,* v. 173, Apr. 8, 1954, p. M1-M32.

Includes "What the Future Holds for Business", Arno H. Johnson; "New Customers: Five Every Minute", R. W. Burgess; "Copper: Many Factors Will Affect Its Future", Kemp G. Fuller; "Steel: What Will Demand, Output Be During 1955-1959?", B. E. Estes; "Titanium: 4-Year Old Industry Sees Problems, Bright Future", C. I. Bradford and D. W. Kaufmann; "Aluminum: What Will We Do With It All?", D. P. Reynolds; "Magnesium: Supply Unlimited, Growth Just Starting", D. T. Surprenant; and "How the Government Can Help You Find Markets", H. W. Ketchum. (A4, Cu, ST, Ti, Al, Mg)

136-A. Directory of Degree Programs in Metallurgy. A. Bornemann, compiler. *Metal Progress,* v. 65, Mar. 1954, p. 96B.

American universities offering curricula in metallurgy. (A3)

137-A. Competition Between Aluminium and Steel. *Mining Journal,* v. 242, Mar. 26, 1954, p. 365-366.

Production and costs. Indicates industries in which aluminum finds an application. From viewpoint of total consumption, competition between iron and steel and aluminum is still, and will remain, on a small scale. Table.

(A4, T general, Al, ST, CI)

138-A. Modern Iron and Steel Works. H. Boddington. *South African Mining and Engineering Journal,* v. 65, pt. 1, Mar. 6, 1954, p. 5, 7, 9.

Architect's approach to design and layout. (A5, D general, Fe, ST)

139-A. United States Steel in the West. John L. Young and W. F. Pruden. *Iron and Steel Engineer,* v. 31, Apr. 1954, p. 55-64.

General review of progress made in the past 23 years. Photographs, graph, map. (A4, D general, ST)

140-A. Foundation Design for Iron and Steel Plants. George S. Richardson. *Iron and Steel Engineer,* v. 31, Apr. 1954, p. 73-76; disc., p. 76-77.

Determination of safe soil-bearing loads and safe pile loading. Applicable to machinery or mill building foundation design. Graphs. (A5, ST)

141-A. Water Supply for Steel Plants. Ross Nebolsine. *Iron and Steel Engineer,* v. 31, Apr. 1954, p. 78-88; disc., p. 88.

Water demands of integrated steel plants, principal features of water systems used, methods of utilization of available supply, quality of water required and plant distribution systems. Tables, chart, diagrams. (A5, ST)

142-A. How a Critical Shortage of Fuel Engineers for Open Hearth Operations Was Solved. William Whigham, Jr. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 21-24; disc., p. 31-32.

Outlines course of study developed by U.S. Steel Corp. and Carnegie Tech. (A3, D2)

143-A. Training Open Hearth Personnel in New Shops. H. L. Tear. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 24-28; disc., p. 31-32.

Outlines program used at J & L's No. 4 shop. Table, graphs. (A3, D2)

144-A. Training of Open Hearth Personnel, Republic Steel Corporation, Cleveland. R. P. Carpenter. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 28-29; disc., p. 31-32.

Program and its results. (A3, D2)

145-A. Training Open Hearth Personnel at Fairless Works. H. A. Parker. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 30-31; disc., p. 31-32.

Background of personnel. Outline of training program. (A3, D2)

146-A. Training Open Hearth Personnel at Ohio Works. E. L. Wentz. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 33-34; disc., p. 39-40.

Program for initiating new procedure in old plant. (A3, D2)

147-A. Training Personnel at No. 2 and No. 4 Open Hearths, Bethlehem Steel Company. M. K. Morris. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 35-37; disc., p. 39-40.

Training of new employees. Refresher instruction as a permanent program. (A3, D2)

148-A. Training Open Hearth Personnel at Lukens Steel Company. C. H. Alexander. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 38-39; disc., p. 39-40.

Separate programs for supervisors and furnace crews. (A3, D2)

149-A. New Materials Developments. Julius J. Harwood. *Research Reviews, Office of Naval Research,* Mar. 1954, p. 7-14.

Directions in which materials research and development programs are heading; recent accomplishments; potential fields of applications. Table, photographs. (A general)

150-A. Waste Handling Is Turned to Profits. *Steel,* v. 134, Apr. 26, 1954, p. 116-117.

Capital expenditure of $79,000 for chip handling equipment and oil reclamation system trebled gross savings in 20 months. Photographs. (A8, G17)

151-A. Plant Nutrients From Slag. Furnace Slag as a Source of Plant Nutrients and Its Liming Effectiveness Relative to Limestone. P. P. Chichilo, W. H. Armiger, A. W. Specht and C. W. Whittaker. *Journal of Agricultural and Food Chemistry,* v. 2, Apr. 28, 1954, p. 458-462.

Study of absorption by crops of some elements contained in blast furnace slag used for soil liming or supplied by soil or added fertilizer. Tables. 12 ref. (A8, D1)

152-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 21, Apr. 1954, p. 173-179.

From "magnet alloys" to "mantle". Tables, graphs, photograph. (To be continued.) (A10)

153-A. (Book.) **Elements of Foundry Costing. Pt. IV. Fettling and Routine Inspection.** H. P. Court and W. E. Harrison. Council of Ironfoundry Associations, 14, Pall Mall, London, S.W. 1.

Analysis of wages, methods of recording fettling-shop output, inspection, overheads, and estimating. (A6, E general)

154-A. (Book.) **High Vacuum in Industry.** Marvin Grossman. 64 p. 1953. Harvard Graduate School of Business Administration, Cambridge, Mass.

Comprehensive survey of future of industrial vacuum technique in America. Includes metallurgical applications, refining, purification, melting, casting, heat treating, and coating of metals with a heat-resisting coating of another metal. (A general, C25, D8, J general, L25)

155-A. (Book.) **Kempe's Engineer's Year-Book.** 59th ed. (2 vols.) 1954. Morgan Brothers Ltd., 28 Essex St., Strand, London W.C. 2. 75s.

Reference book on technical and scientific data in all fields of engineering. (A general)

156-A. (Book.) **Workshop Costs and Costing.** P. S. Houghton. Chapman and Hall, Ltd., 37 Essex St., London, W. C. 2, England. 35s.

Advantages of costing systems in general for new businesses, foundries, etc., treated from the viewpoint of an engineer. (A4, A6)

157-A. Directory of Materials. 18th Ed. *Machine Design,* v. 26, May 1954, sec. 2, p. 1-204.

Trade names, producers, specifications and information on ferrous and nonferrous metals, nonmetallic materials and finishes and coatings. (A10, L general, S22, Fe, EG-a)

158-A. The Non-Ferrous Scrap Industry. J. Chalmers. *Metal Industry,* v. 84, Apr. 30, 1954, p. 366-367.

Export and import question and its effects on British prices. (A8, EG-a)

159-A. Metallurgy at Los Alamos 1943-1945. Cyril Stanley Smith. *Metal Progress,* v. 65, May 1954, p. 81-89.

History of Los Alamos wartime work; fabrication of uranium; recently declassified information on plutonium metallurgy. Graphs, table, photographs. (A general, U, Pu)

160-A. Current Russian Metallurgical Texts. IV. Carl A. Zapffe. *Metal Progress,* v. 65, May 1954, p. 125 + 5 pages.

Seven technical books critically reviewed. Books are abstracted separately. (A general)

161-A. Zinc Has Not Been Replaced by Aluminum in Die Casting Industry, Institute Told. David Laine. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Apr. 1954, p. 10-11.

Economic analysis of nickel, zinc and aluminum situations. Table. (A4, E13, Zn, Al, Ni)

162-A. Metallurgical Problems in Nuclear Power Reactors. I. General Considerations. Henry H. Hausner and John R. Bedell. *Sylvania Technologist,* v. 7, Apr. 1954, p. 35-41.

Operation and factors influencing selection of materials for fuels, cladding, coolants and coolant systems. Tables, diagrams, photograph. 6 ref. (To be continued.) (A general, T25)

163-A. Industrial Progress Related to Available Materials. (Digest of "Chemical Developments and Engineering Materials", by Harold L. Maxwell, *ASTM Bulletin,* Dec. 1953, p. 47-50.) *Metal Progress,* v. 65, May 1954, p. 148, 150.

Choice of materials should be based on corrosion rate, material cost, workability, absence of product contamination, minimum of maintenance costs and least interruption of operations. (A general)

164-A. Metal Canada. I. H. McLeod. *Canadian Metals,* v. 17, May 1954, p. 8 + 10 pages.

Annual review of metalworking industry in Canada. Tables. (A general, Ni, Zn, Pb, Cu, Al, Fe, ST)

165-A. Compressed Air for Ford's Cleveland Foundry. *Industry and Power,* v. 66, May 1954, p. 94-97.

Outstanding distribution system to supply compressed air to many sites throughout huge foundry. Careful planning resulted in low pressure drop in lines. Diagram, photographs. (A5, E general)

166-A. The Universal Decimal Classification Applied to Metallurgical Literature. Einar Ohman and J. P. Saville. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 183-188.

Need for rapid and accurate means of classifying. Describes system, its construction and present state. 5 ref. (A general, U8)

167-A. Department of Metallurgy at the University of Cambridge. G. Wesley Austin. *Metal Treatment and Drop Forging,* v. 21 May 1954, p. 215-223.

Facilities for teaching and research; resumé of research work in progress. Photographs. (A9, A3)

168-A. The First Century: Aluminum in France. *Modern Metals,* v. 10, May 1954, p. 82-84, 86.

Historical review. Photographs, graph, map. (A2, Al)

169-A. Five Steps to Ward Off Plant Fires. W. K. Ousley. *SAE Journal,* v. 62, May 1954, p. 29-31.

Abridged from "What Makes a Plant Safe?" presented at SAE Annual Meeting, Detroit, Jan. 1954. Studies show all major industrial fires could have been avoided if five basic, simple rules had been followed. Diagram. (A7)

170-A. The Iron Plantation. Arthur C. Bining. *Steelways,* v. 10, June 1954, p. 4-7.

Iron was once produced on plantations. A historian traces their growth and decline from colonial times until late in nineteenth century. Drawings, photographs. (A2, T26, T3, Fe)

171-A. Recent Trends in Engineering. *Times Review of Industry,* v. 8, new ser., May 1954, p. 57.

Briquetting press for recovery of cast iron. Photograph. (A8, B17, CI)

172-A. (German.) **Trackless Conveying in Iron and Steel Works.** Hans-Dieter Zeumer. *Stahl und Eisen,* v. 74, no. 9, Apr. 22, 1954, p. 561-570.

Handling of ores, rubbish and scrap, trucks, shovel loaders, refractory brick pliers and tipping containers. Photographs. 13 ref. (A5, ST)

173-A. New Metals in Engineering. L. B. Pfeil. *Engineering,* v. 177, May 14, 1954, p. 620-621.

Abridged from paper presented before "Institute of Marine Engineers", Apr. 1954. Covers graphitic nickel, spheroidal-graphite cast iron and heat resisting and hard surfacing materials. Tables. (A general, Ni, CI, SG-h)

174-A. The New Radiometallurgy Laboratory at the Hanford Atomic Operation. Thomas W. Gore. *Metal Progress,* v. 65, June 1954, p. 81-87.

Prime activity is examination of physical characteristics and mechanical properties of irradiated materials, particularly uranium fuel slugs. Covers laboratory design. Photographs, diagram. (A9, U)

175-A. Review of the Metals and Minerals. *Mining Journal (Annual Review),* 1954, May p. 7 + 38 pages.

Includes "Gold" and "Silver", E. Baliol Scott; "The Platinum Metals"; "Copper" and "Tin", Ursel B. Scott; "Tinplate"; "Lead" and "Zinc", J. A. Dunn; "The London Metal Exchange"; "Aluminium", Smith Bracewell; "Magnesium"; "Titanium" and "Nickel", A. Graham Thomson; "Iron and Steel", J. H. Thompson; "Manganese"; "Nickel", A. Graham Thomson; "Chromium"; "Tungsten, Molybdenum and Vanadium"; "Cadmium"; "Beryllium"; "Cobalt"; "Columbium and Tantalum", R. Bruce Dunfield; "Reflections on Uranium Ore Production", Robert A. Mackay; "Coal", W. Davis; "Oil", W. J. Harris; "Asbestos"; and "The Diamond Industry". Photographs, tables. 23 ref. (A general, B12, Au, Ag, Pt, Sn, Cu, Pb, Zn, Al, Mg, Cr, W, Mo, V, Cd, Be, Co, Cb, Ta, U, Fe)

176-A. Technical Progress During the Year. *Mining Journal (Annual Review),* 1954, May, p. 65 + 27 pages.

Includes "Mineral Exploration", G. A. Schnellmann; "Metal Mining Developments", J. B. Richardson; "Coal Mining Practice", W. Davis; "Progress in Mineral Dressing", F. B. Michell; "Extraction Metallurgy", Graham Oldham; and "Powder Metallurgy and Alloying", A. E. Williams. Photographs, diagrams, tables. 45 ref. (A general, B general, C general, H general, U, Fe, Pb, Cu, U, Zn, Mo, Cb, W, Ti, Ni)

177-A. Copper Production in 1953. David N. Skillings. *Skillings' Mining Review,* v. 43, May 29, 1954, p. 1-2, 14-15.

Statistical data on 28 leading copper producers for 1953. Photographs. (A4, Cu)

178-A. (Book.) **ASME Handbook. Metals Properties.** Samuel L. Hoyt, editor. 433 p. 1954. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. $11.00.

Charts and tables present data on strength, hardness, machinability, electrical and thermal conductivity, chemical composition, heat treatment, uses, working characteristics, and other pertinent information on more than 500 metals in common industrial use.

(A general, Q general, P general)

179-A. (Book.) **Machinery's Handbook.** 15th Ed. 1911 p. Industrial Press, 148 Lafayette St., New York 13, N. Y. $9.00.

Makes available recent and basic information, data, and formulas that user in mechanical field needs to keep abreast of current developments. (A10)

180-A. (Book—German.) **Metallic Materials for the Machine Designer.** E. Bickel. 442 p. 1953. Springer-Verlag, Berlin.

Structure and properties of crystals; alloy equilibrium diagrams and corresponding atomic theory; physical and mechanical properties. (A general)

181-A. Safe Handling of Metal Hydrides. M. D. Banus. *Chemical and Engineering News,* v. 32, June 14, 1954, p. 2424-2427.

Hydrides can be handled safely if adequate precautions, combined with careful engineering and process development, are employed. Table, photographs, diagram. (A7)

182-A. Joint Operation of Multiunit Complexes for Minimum Cost. Karl M. Mayer. *Industrial and Engineering Chemistry,* v. 46, June 1954, p. 1247-1255.

Aids individual production supervisors, once assigned production quotas, to determine if they are obtaining desired output from processes, pot lines, mills or plants at minimum cost to their companies. Graphs, diagrams. 2 ref. (A4)

183-A. The Nature of Education in Metallurgical Engineering. Robert F. Mehl. *Journal of Metals,* v. 6, June 1954, p. 728-733.

Aims of education, need for stressing basic principles, development of skills and industry and university relationships. Photographs. (A3)

184-A. A Description of Aluminium Laboratories Ltd. at Banbury. *Sheet Metal Industries,* v. 31, no. 326, June 1954, p. 447-462.

Equipment and role of research center in field of fabrication and utilization. Diagram, photographs. (A9, Al)

185-A. (German.) **Recent Development in the Field of the Sorting of Shavings.** Edmund R. Thews. *Metallurgie und Giesserei Technik,* v. 4, no. 4, Apr. 1954, p. 182-184.

Methods for separating metal shavings for further processing. Diagrams. (A8, Cu, Sn, Pb)

186-A. (Polish.) **Possibilities of Refining Unclassified Scrap of Non-Ferrous Alloys by Means of Solid Paraffin Chlorides.** Stanislaw Woloszyn. *Hutnik,* v. 21, no. 3, Mar. 1954, p. 72-74.

Principles, advantages and possibilities of various methods. Tables, graph. 10 ref.

(A8, Al, Cu, Mg, Sn, Pb, Zn)

187-A. (Swedish.) **Rationalization and Man-Power Problems in the Iron and Steel Industry From a Physiological Point of View.** E. Hohwü Christensen and Folke Nilsson. *Jernkontorets Annaler,* v. 138, no. 5, 1954, p. 288-309.

Determination of working capacity of individual workers. Evaluation of physiological stress of different jobs. Tables, charts, photographs. (A6, D general)

188-A. Development in the Iron and Steel Industry in Great Britain. T. P. Colclough. *Engineer,* v. 197, June 11, 1954, p. 856-857.

Excerpts from lecture delivered at Royal Institution, London. Re-equipment and reorganization during the thirties. War experience between 1939 and 1945; reconstruction of the industry since the end of the war; and future prospects. (A4, A6, Fe, ST)

189-A. Salute to New England. *Iron Age,* v. 173, June 24, 1954, p. 123 + 42 pages.

Survey of facilities for metalworking, research and machine tool production. Labor and financial resources. Industrial opportunities. Tables, graphs, photographs.

(A general)

190-A. The Role of Aircraft Research in Furnace Design. J. H. Chesters. *Iron & Steel,* v. 27, June 1954, p. 207-212.

Similarity between aerodynamic and furnace problems. Photographs, diagrams, micrographs. 6 ref. (To be concluded.) (A9)

191-A. Intra-Plant Handling of Round Billets and Pipe With Special Automotive Equipment. J. D. Tyson. *Iron and Steel Engineer,* v. 31, June 1954, p. 107-114; disc., p. 114-116.

Rubber-tired equipment gives improved efficiency and performance. Diagrams, photographs. (A5)

192-A. Aluminum vs. Steel. I. *Modern Metals,* v. 10, June 1954, p. 34-38, 40.

Defines area of competition between the metals and attempts a comparison between the two industries in terms of production costs and prices. Tables. (A4, Al, ST)

193-A. Progress in Steelmaking. *Steel,* v. 135, July 5, 1954, p. 72, 74, 76.

British steel industry unifies research. Photographs. (A9)

194-A. Maintenance-Organization. C. A. Gallaher. *Western Metals,* v. 12, June 1954, p. 48-51.

Exacting maintenance techniques required by today's high precision metalworking plant. Photographs, diagram. (A5, G general)

195-A. Guide for Steel Buyers. *Steel,* v. 135, July 12, 1954, sec. 2, 112 p.

Listing of manufacturers and products. Includes indexes. (A10, ST)

196-A. (Book.) **Metal Progress Data Sheets.** 192 p. 1954. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. $6.00.

Selection of useful data published in monthly issues since 1930. (A general)

197-A. (Book.) **Nonferrous Metals—World Production and Consumption.** 258 p. 1953. Statistics compiled by Metallgesellschaft A. G., Reuterweg 14, Frankfurt-on-Main.

Surveys industrial production and raw materials requirements during the last 25 years. (A4, EG-a)

198-A. (Book.) **The Wire Industry Encyclopaedic Handbook, 1954.** 492 p. 1954. The Wire Industry Ltd., 33 Furnival St., London.

Trade summary for 1953, branded names for wire, wire machinery, etc. American wire specifications and English and foreign wire terminology. (A10, F28, S22)

199-A. (Book—German.) **(Alloy Handbook of Nonferrous Metals.) Legierungs-Handbuch der Nichteisenmetalle.** Ernst Brunhuber. 196 p. 1954. Fachverlag Schiele und Schön, Berlin. DM21.

Covers 1359 nonferrous alloys. Grouped under alloys containing aluminum, copper, magnesium, and lead; other heavy-metal alloys; and precious-metal alloys. (A10, EG-a)

200-A. Reclamation of Aluminium From Scrap. P. V. Deshmukh. *Central Electrochemical Research Institute, Karaikudi, Bulletin,* v. 1, Jan. 1954, p. 23-25.

Methods, fluxes, and furnaces. 12 ref. (A8, Al)

201-A. Steel on the Defensive. Competition From Aluminium. *Engineering,* v. 178, July 2, 1954, p. 10-11.

World production of aluminum; areas of competition with steel; relative prices and costs; future prospects. Tables. (A4, Al, ST)

202-A. Development in the Iron and Steel Industry in Great Britain During the Last Twenty-Five Years. T. P. Colclough. *Iron and Steel Institute, Journal,* v. 177, July 1954, p. 297-304.

Review of improvements in productivity and quality. Future prospects. Tables. (A4, D general, ST)

203-A. (German.) **Processing Hard-Zinc in the Zinc-Distillation Plant.** H. Kiessler. *Metall,* v. 8, nos. 13-14, July 1954, p. 544-545.

Recovery of zinc by melting and purification. Table. (A8, C22, Zn)

204-A. The Current Domestic Zinc Situation. Howard I. Young. *American Zinc Institute, Journal,* v. 32, 1954, p. 28-33.

Production and consumption statistics. Need for production curtailment in view of decreased consumption. (A4, Zn)

205-A. World Zinc Situation. Jean Vuillequez. *American Zinc Institute, Journal,* v. 32, 1954, p. 39-51.

Trends in production, prices and consumption. Graphs. (A4, Zn)

206-A. Use of Zinc in Brass Mills in 1954. C. C. Felton. *American Zinc Institute, Journal,* v. 32, 1954, p. 68-73.

Production statistics and outlook of various industries using zinc and brass products. Possibilities for future consumption trends. Table. (A4, Cu, Zn)

207-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 21, June 1954, p. 269-276; July 1954, p. 317-323.

From "metallurgical coke" to "needled steel". (To be continued.) (A10)

208-A. Air Power for Metalworking. I. Air Power Unlimited Serves Broad Industrial Field. Lester F. Spencer. **II. Engineering the Compressor Installation for Maximum Efficiency.** Carl F. Benner. *Tooling and Production,* v. 20, July 1954, p. 56-66, 68, 72-73.

Description of industrial air tools and other uses for compressed air. Planning, selecting and installing the compressed air plant. Tables, photographs. 7 ref. (To be continued.) (A5)

209-A. (Czech.) **What Are We Expecting From Plants Which Treat Nonferrous Metals.** Milos Spevak.

Hutnické Listy, v. 9, no. 6, June 1954, p. 348-351.

World consumption and production trends in nonferrous metals. Comparison with trends in steel statistics. Graphs. (A4, EG-a)

210-A. Review of Literature on Health Hazards of Fluorine and Its Compounds in the Mining and Allied Industries. S. J. Davenport and G. G. Morgis. *U. S. Bureau of Mines, Information Circular* 7687, June 1954, 55 p.

Toxicity studies in production of aluminum and beryllium, in magnesium foundries and in other industries. Effects on plants and animals. Tables. 101 ref. (A7, Al, Be, Mg)

211-A. (Book.) **ASM Review of Metal Literature.** v. 10. Marjorie R. Hyslop, editor. 711 p. 1953. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. $15.00.

Annual compilation of abstracts from ASM *Metals Review.* Includes subject and author indexes. (A10)

212-A. (Book.) **ASTM Proceedings: Volume 53, 1953.** 1197 p. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $12.00.

Testing ferrous and nonferrous metals, paints, sealants, and adhesives. Papers on metals have been previously abstracted. (A general)

213-A. (Book.) **Minerals for the Chemical and Allied Industries.** Sydney J. Johnstone. 692 p. 1954 John Wiley & Sons Inc., 440 Fourth Ave., New York 16, N. Y. $11.50.

Properties, source of supply, processing, and uses of metallic and nonmetallic minerals in various industries. Includes metallurgy of most nonferrous metals. (A general)

214-A. (Book) **Quin's Metal Handbook, 1953.** 40th Ed. 784 p. 1954. Metal Information Bureau Limited, London. 25/—.

Reference book on ores, metals, iron and steel, and scrap. Prices, production, consumption, exports, imports, brands, stocks, analyses, properties, uses, and weights. (A4)

215-A. (Book.) **A Textbook of Metallurgy.** A. R. Bailey. 500 p. Macmillan & Co. Ltd. St. Martin's St., London, W.C.2., England. 30s.

Physical metallurgy and metal manufacture; melting, alloying, and casting practice; working and fabrication; testing and pyrometry. (A general)

216-A. (Book—German.) **(Development of Wheels for Trucks and Buses.) Aus der Entwicklung der Räder für Lastwagen und Omnibusse.** 176 p. 1952 Georg Fisher Aktiengesellschaft, Schaffhausen, Switzerland.

Electric arc furnaces, steel foundry, forging plant, and machine shops of Georg Fischer works. (A5, T21, ST)

217-A. (Book—German.) **(Hundred Years of Heraeus. Anniversary Volume Published on Occasion of the Centennial of the W. C. Heraeus GmbH Platinum-Melting Plant Hanau.) Des 100 Jährigen Jubiläums der Firma W. C. Heraeus GmbH. Platinschmelze Hanau.** K. Ruthhardt, compiler. 406 p. 1954. Gestaltung und Gesamtherstellung Brönners Druckerei, Inhaber Breidenstein, Frankfurt am Main, Germany.

Collection of 27 articles on precious metals, electric heating, quartz glass, and thin films. (A5, Pt)

218-A. Operating Experiences With Gas-Turbine Plants in the Steel Industry. I. H. Pfenninger. *Blast Furnace and Steel Plant,* v. 42, Aug. 1954, p. 942 + 4 pages.

Fuels, applications and performance of Brown-Boveri turbines. Diagrams, tables, graphs. (To be continued.) (A5, ST)

219-A. Systems for the Destruction of Cyanide Wastes at Buick Motor Division. R. J. Brink. *Industrial Waste Conference, Proceedings, Purdue University,* Eighth, 1954, p. 72-85.

Equipment and operating procedures. Diagrams, tables. (A8)

220-A. Methods for Treating Metal Finishing Wastes. Hubert S. Kline. *Industrial Waste Conference, Proceedings, Purdue University,* Eighth, 1954, p. 96-104.

Treatment of cyanide and chromic acid wastes. Neutralization and chemical precipitation. (A8)

221-A. Plating Waste Treatment. C. F. Paulson. *Industrial Waste Conference, Proceedings,* Eighth, 1954, p. 215-221.

Treatment of electroplating rinse waters by ion exchange. Diagram, table. (A8, L17)

222-A. AEC Urges Uranium Recovery From Waste Phosphate Sources. *Pit and Quarry,* v. 47, Aug. 1954, p. 83, 86, 98.

Description of recovery units. Flowsheets, photographs. (A8, U)

223-A. Do You Want Production or Profit? Nyles V. Reinfeld. *Tooling and Production,* v. 20, Aug. 1954, p. 44-48, 69.

Application of linear programming can increase company profits in addition to studying a wide range of management problems. Tables, diagrams. (A4)

224-A. (German.) **Silicosis in Foundries in Area of Velbert, Heiligenhaus and Neviges.** Walter Reinl, Wolfgang Greinert and Werner Rascher. *Staub,* 1954, no. 36, p. 213-227.

Incidence and types of silicosis in various kinds of foundries according to age groups, specific jobs and sex. Tables, graph. 27 ref. (A7, E general)

225-A. Profitable Use of Exhaust Fume. R. J. Ruff. *Industrial Heating,* v. 21, Aug. 1954, p. 1583 + 8 pages.

Use of catalytic combustion, application to core ovens and drying installations. Graphs, diagrams, photograph. (A8)

226-A. Planned Maintenance in a Steelworks. I. How Planning Is Organized. A. G. Thomson. *Iron & Steel,* v. 27, Aug. 1954, p. 423-424.

System designed to prevent and reduce occurrence of breakdowns and minimize their severity by regular inspection and attention to plant. (To be continued.) (A5, D general)

227-A. Custom-Engineered Wire Items Mass-Produced by Fabricator. Howard E. Jackson. *Western Metals,* v. 12, Aug. 1954, p. 60-62.

Seattle wire products fabricator tailors each job for the customer, yet has engineered production on mass basis. Photographs. (A5, F28, G general)

228-A. The Importance of the Steel Industry. Ernest T. Weir. *American Iron and Steel Institute, Preprint,* 1954, 12 p.

Economic analysis. Table. (A4)

229-A. Discharging Iron Ore From Ship to Wagon. *Engineering,* v. 178, Aug. 13, 1954, p. 207-211.

Improved unloading and handling plant capable of 1,250,000 tons annually. Photographs, diagrams. (A5, Fe)

230-A. Controlling Uranium Dust. H. I. Miller, Jr. *Heating, Piping & Air Conditioning,* v. 26, Sept. 1954, p. 109-113.

Design of exhaust system. Diagrams. 4 ref. (A8, U)

231-A. Scrap Report—Tests Emphasize Scrap Quality Control. Incinerator Scrap and No. 2 Bundles Related to Adverse Heat Time. George G. Mueller. *Journal of Metals,* v. 6, Sept. 1954, p. 952-953.

Bundled scrap gave higher sulfur, copper and tin residuals than regular scrap. Tables. (A8, D2, ST)

232-A. Scrap Report—Ingot Yield Rises as Market Permits Greater Care in Scrap Selection. A. K. Moore. *Journal of Metals,* v. 6, Sept. 1954, p. 953.

Effects of scrap quality on melting speed and amount of residuals. Tables. (A8, D2, ST)

233-A. The Safety Factor in the Design of Seamless Steel Gas Cylinders. S. E. Mitchell. *Metallurgia,* v. 50, no. 298, Aug. 1954, p. 87-89.

Factors to be considered. Comparison of practices in various countries. Graph, table. (A7, SS)

234-A. Adequate Strategic Metal Supply in Event of Future National Emergency Assured by Gov't. John D. Morgan, Jr. *Metals (Daily Metal Reporter Monthly Supplement),* v. 25, Aug. 1954, p. 7-8.

Factors leading to increasing stocks. (A4, B10)

235-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 21, Aug. 1954, p. 369-375.

From "needlestone" to "nilo". Diagrams, tables. (To be continued.) (A10)

236-A. (French.) **Physics and Ferrous Metallurgy.** Paul Bastien. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 273 + 5 pages.

Role of physics in the production of metals and metallurgical research. (A general, U1, ST)

237-A. (French.) **The Nonferrous Metals Market.** J. Bertin-Roulleau. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 341-343.

World trends in production and consumption. (A4, Cu, Pb, Sn, Zn)

238-A. (Book.) **Glossary of Terms Relating to Iron and Steel. British Standard 2094. I. General Metallurgical, Heat Treatment and Testing Terms. II. Steelmaking. III. Hot Rolled Steel Products (Excluding Sheet, Strip and Tubes). IV. Steel Sheet and Strip. V. Bright Steel Bar and Steel Wire. VI. Forgings and Drop Forgings, 1954.** British Standards Institution, British Standards House, 2 Park St., London, W.1, England. Pt. I, 6/-. Other parts 2/6d each.

Prepared at the request of the Iron and Steel Industries Committee with the purpose of helping to establish a uniform application of terms in current use. (A10, Fe, ST)

239-A. (Book.) **Metals Technology.** Alfred Borneman, editor. 109 p. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. $3.00.

Fundamentals of metals and their behavior. Detailed laboratory exercises and experiments for 24 operations, plus a classification of metals, alloys, and micrographs. (A general)

240-A. (Book.) **Nuclear Engineering.** F. J. Van Antwerpen, editor. Pt. I. 280 p. 1954. American Institute of Chemical Engineers, 120 East 41st St., New York 17, N. Y.

Papers from the meeting on nuclear engineering sponsored by the American Institute of Chemical Engineers and the University of Michigan at Ann Arbor on June 20 to 25, 1954. Includes discussions of beryllium, uranium and thorium metallurgy; heat transfer; operating experience with graphite-moderated piles; and description of various reactors. (A general)

241-A. (Book.) **Rare Metals Handbook.** Clifford A. Hampel, editor. 657 p. 1954. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. $12.00.

Comprehensive survey of available data on 34 rare or uncommon metals. (A, EG-b)

242-A. (Book.) **The Story of Shotts.** Augustus Muir. 80 p. 1954. The Shotts Iron Company, Ltd., Edinburgh, Scotland.

Historical sketch (A2, A5)

243-A. Dangerous Materials in Welding. *Australasian Engineer,* 1954, July, p. 89, 91-92, 95.

Toxicology of fumes of cadmium and zinc oxide, lead, fluorides, carbon monoxide, oxides of nitrogen and nitrous gases. (A7, K general)

244-A. "Seraphim" Extensions at Scunthorpe. *Engineer,* v. 198, Aug. 13, 1954, p. 236-238.

Improvements in plant facilities of the Appleby-Frodingham iron works. Photographs, table. (A5, Fe)

245-A. Metal Cans of the Future. K. W. Brighton, R. W. Pilcher and R. H. Lueck. *Food Technology,* v. 8, Sept. 1954, p. 424-430.

World politico-economies and tin resources. Alternate methods of food enclosure. Map, photographs, tables. 13 ref. (A4, T10, Sn)

246-A. Cooling Hot Spots in Industry. Alfred B. Wason. *Heating and Ventilating,* v. 51, Sept. 1954, p. 88-94.

Analysis of heat-producing operations. Ventilation and other corrective measures. Graph, tables, diagrams. (A5, A7)

247-A. Stampings—Should You Make Them or Buy Them? C. C. Caditz. *Iron Age,* v. 174, Sept. 23, 1954, p. 107-111.

Economics of specialized production. Drawings. (A4, G3)

248-A. Import Ore Handling—Machines and Practices. Erle M. Hays. *Iron and Steel Engineer,* v. 31, Aug. 1954, p. 84-90; disc., p. 90-94.

Problems involved in unloading iron ore when standard ocean-going cargo boats are used. Photographs, diagrams. (A5, B10, Fe)

249-A. Metallurgical Aspects of Plant Maintenances. T. G. Bradbury. *Iron and Steel Engineer,* v. 31, Sept. 1954, p. 90-97.

Importance of good understanding of properties and characteristics of materials in equipment maintenance. Micrographs, graphs, tables, photographs. (A5)

250-A. Air Pollution Control in the Bethlehem Steel Company. Allen D. Brandt. *Iron and Steel Engineer,* v. 31, Aug. 1954, p. 103-106; disc., p. 106-107.

Control program for one particular plant. Photograph. 2 ref. (A7, D general)

251-A. Japanese Steel Stages Comeback. Stephen Badlam. *Iron and Steel Engineer,* v. 31, Aug. 1954, p. 161-162, 165-166.

Plants, equipment and procedures responsible for present day scale of operation. Photographs, tables, diagram. (A general, ST)

252-A. New Method for Handling Steel Tube. P. I. Craddock. *Mechanical Handling,* v. 41, Sept. 1954, p. 516-520.

Operations and advantages of method in unloading, storage and movement of steel tube over 30 in. in length. Photographs, tables, diagrams. (A5, ST)

253-A. Work Study and the Materials Handling Engineer. C. G. Chantrill. *Mechanical Handling,* v. 41, Sept. 1954, p. 541-546.

Secret of materials handling, utilization of resources, effective production, development of work study and its measurement and application to materials handling and flow of materials. (To be continued.) Diagrams. (A5)

254-A. Metallurgy in the Days of Alchemy. Carl Andrew Zapffe. *Metal Progress,* v. 66, Sept. 1954, p. 89-95.

Development of alchemy and its subsequent evolution into modern science. Tables. (A2)

255-A. Integrated Treatment for Metal-Finishing Wastes. L. E. Lancy. *Sewage and Industrial Wastes,* v. 26, Sept. 1954, p. 1117-1125.

Evaluation and treatment of wastes. Examples. Flow sheets, table, graphs. 20 ref. (A8, L general)

256-A. Disposal of Electroplating Wastes by Oneida, Ltd. V. Plant Operation. Paul W. Eichenlaub and James Cox. *Sewage and Industrial Wastes,* v. 26, Sept. 1954, p. 1130-1135.

Silver recovery and processing of cyanide wastes. Tables. 3 ref. (A8, L17, Ag)

257-A. Research in the United States. (Digest of "Research—One of the Factors in the Industrial Success of the United States", by Georges Delbart; *Fonderie*, Jan. 1954, p. 3745-3754.) *Metal Progress*, v. 66, Sept. 1954, p. 194, 196, 198.

American research organizations described and compared with European equivalents. (A9)

258-A. Product Diversification. *Steel*, v. 135, Sept. 13, 1954, p. 112-120.

New products replace "losers", find work for idle facilities, balance out cycles, provide outlets for proprietary items and insure growth. All lead to greater profit. Photograph. (A4)

259-A. Steel Industry Statistics. *Steel*, v. 135, Sept. 20, 1954, p. 112-126.

Report on expanded steel capacity in U. S. and Canada. Tables. (A4, ST)

260-A. Stampings From Scrap. Ernest J. Urbas. *Tooling and Production*, v. 20, Sept. 1954, p. 62-63.

Possibilities for salvage of areas of metal that usually finish as strip or slug scrap by making additional stampings from the scrap areas. Photographs. (A8, G3)

261-A. The Interactions of Applied Science and Technology for the Civilian Economy and for National Security. Mervin J. Kelly. Paper from "Yearbook of the American Iron and Steel Institute". p. 15-35.

Effects of industrial and technical developments on military and economic conditions. (A4)

262-A. (French.) **Possibility of Use of Gas Turbines in Heating Plants and in Industry.** A. Pineau. *Chaleur & Industrie*, v. 35, no. 349, Aug. 1954, p. 231-238.

Gas turbines in blast furnace and other installations, economic aspects, future prospects. Diagrams, photographs. (A4, A5, D1)

263-A. (German.) **Hazards in the Production and Processing of Aluminum.** W. Koetschau. *Aluminium*, v. 30, nos. 8-9, Aug.-Sept. 1954, p. 365-369.

Accident prevention and occupational diseases involved. (A7, Al)

264-A. (German.) **Design and Operation of a Central Materials Department.** Kurt Lehmann, Hans Scholten and Oskar Wagner. *Stahl und Eisen*, v. 74, no. 18, Aug. 26, 1954, p. 1113-1128; disc., p. 1128-1132.

Methods of controlling inventories and turnover of all materials used in metallurgical plants. Flow charts, specification blanks, diagrams. (A5)

265-A. Metallurgical Trends of Interest to Chemical Engineers. L. Rotherham. *Chemistry & Industry*, 1954, no. 38, Sept. 18, p. 1164-1170.

Developments in extractive and physical metallurgy of uranium, titanium, zirconium, tantalum, columbium and molybdenum. (A general, U, Ti, Zr, Ta, Cb, Mo)

266-A. (French.) **The End of the Neolithic Period and the Appearance of Metals.** A. A. Sanfourche. *Revue de métallurgie*, v. 51, no. 8, Aug. 1954, p. 517-523.

Data on corrosion of copper, bronze and iron applied to chronological boundaries assigned to different ages of civilization. Result is that the beginning of the "metal age" must be carried back beyond the time classically granted. Diagram. 18 ref. (A2, R general)

267-A. (Book.) **Metal Statistics 1954.** 47th Ed. 848 p. American Metal Market, 18 Cliff St., New York, N. Y. $3.00.

Statistical information on ferrous and nonferrous metals and various economic subjects. (A4)

268-A. Some Views on the Present Position and Future of Electro-Metallurgy in India. E. H. Bucknall. *Central Electrochemical Research Institute, Karaikudi, Bulletin*, v. 1, July 1954, p. 6-18.

General review of present status, research underway and predictions of future expansion. Tables. 19 ref. (A general, C23, L17)

269-A. The Dilution Method for Industrial Waste Disposal. Hubert S. Kline and Joseph F. Fletcher. *General Motors Engineering Journal*, v. 1, Sept.-Oct. 1954, p. 38-43.

Regulated discharge of waste solutions solves stream pollution problem. Photographs, table, diagram. 2 ref. (A8)

270-A. Guides in Dust Collector Selection. John M. Kane. *Heating and Ventilating*, v. 51, Oct. 1954, p. 77-82.

Understanding basic data regarding equipment governs selection of proper type dust collector for a particular industrial process. Photographs, tables. (A8)

271-A. Condensed Review of Some Recently Developed Materials. *Machinery*, v. 61, Oct. 1954, p. 170-186.

Extensive tabulation of metals and metalworking agents with their properties and applications. (A general)

272-A. Swiss Non-Ferrous Metal Industry. R. Stadler. *Metal Industry*,

v. 85, Sept. 24, 1954, p. 253-254.

Development and present status. (A general, EG-a)

273-A. Research Laboratories of A.I.A.G. Neuhausen. A. von Zeerleder. *Metal Industry,* v. 85, Sept. 24, 1954, p. 267-270.

Organization, equipment and aims of the Aluminium Industries A. G. research program. Photographs, graph, table. (A9, Al)

274-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 21, Sept. 1954, p. 413-419.

From "Nilvar" to "Notch". Tables, photographs, diagrams, micrograph, circuit. (To be continued.) (A10)

275-A. A New Frontier in Metals. Bruce W. Gonser. *Monthly Business Review,* 1954, Oct., p. 12.

Effects of extremely small or trace amounts of impurities on the properties of metals. The new frontier is the study of metals of more than 99.9% purity. (A general)

276-A. U. S. Bureau of Mines Reports on Iron Ore in 1953. R. W. Holliday. *Skillings Mining Review,* v. 43, Oct. 16, 1954, p. 1-2, 12-13.

Production and consumption statistics for U.S. Tables. (A4, Fe)

277-A. A Nuclear Reactor for Metallurgical Research. J. J. O'Connor and L. S. Foster. Paper from "Nuclear Engineering". American Institute of Chemical Engineers, p. 59-62.

Reactor designed for research utilizing neutrons in the fields of metallurgy and solid-state physics. Diagrams. (A9)

278-A. Iron and Steel. B. R. Davidson, R. W. Nichols and C. J. Leadbeater. Paper from "Reports on the Progress of Applied Chemistry". Society of Chemical Industry, p. 171-193.

Developments in Great Britain in steels and iron alloys. Covers properties, surface treatments and powder metallurgy. 178 ref. (A general, ST, Fe)

279-A. (German.) **The Behavior of Materials as a Problem in Design and Production.** H. Wiegand. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 27, Sept. 21, 1954, p. 927-932.

Fabrication properties of different steels and other metals with various surface conditions and surface treatments. Forming and welding procedures, high-temperature and fatigue resistance. Stresses importance of co-operation between the supplier, designer and production engineer. Diagrams, graphs, tables. 7 ref. (A general, ST)

280-A. (Polish.) **Reprocessing of Aluminum Scrap.** Marian Orman. *Hutnik,* v. 21, no. 7, July 1954, p. 229-239.

Types of scrap, sorting, remelting and refining methods. Equipment. Diagrams, tables. 10 ref. (A8, Al)

281-A. Automation: Today's Challenge to Process Engineers. *Iron Age,* v. 174, Oct. 21, 1954, p. 213-236.

Seven papers giving principles and specific examples of benefits gained by mechanized handling in production of metal articles. Photographs, diagrams. (A5)

282-A. Research in Canada. Harold J. Roast. *Metal Progress,* v. 66, Oct. 1954, p. 138-140.

Government-sponsored scientific research in Canada is a $35,000,000 business carried on by the National Research Council in 15 large and modern buildings by a staff of 2000. Varied metallurgical projects, both scientific and practical, are pursued. Photographs. (A9)

283-A. Fundamental Research in Water Pollution Abatement at Mellon Institute. Richard D. Hoak. *American Iron and Steel Institute, Preprint,* 1954, 17 p.

Factors involving the metals industry. 8 ref. (A8)

284-A. 16th Biennial Materials of Construction Report. I. Survey of Materials. II. Corrosion Data Charts. III. Directory of Materials. *Chemical Engineering,* v. 61, Nov. 1954, p. 171-234.

Covers mechanical properties, corrosion resistance and applications of iron and steel, high-silicon irons, stainless steels, cast high alloys, 20 alloy, Worthite, Chlorimet, Hastelloys, aluminum, copper and alloys, lead, nickel and alloys, tantalum, polyethylene, unplasticized PVC, carbon and graphite, rubbers, glassed steel, cements, and fluorinated resins. Tabular and graphic data and suppliers. (A general, R general, Q general, T general)

285-A. The Economics of Replacement in the Steel Industry. G. G. Beard. *Iron and Steel Engineer,* v. 31, Oct. 1954, p. 55-65; disc., p. 65-66.

Procedures for determining time to replace equipment. Graphs, tables. 2 ref. (A4)

286-A. (Book.) **Introduction to Nuclear Engineering.** Raymond L. Murray. 418 p. 1954. Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N. Y. $7.00.

Design, construction, testing, and

operation of equipment using nuclear materials. (A general, Pu, U)

287-A. (Book.) **Materials of Construction.** M. O. Withey and G. W. Washa. 887 p. 1954. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $9.00.

Testing and properties of various metals. Surveys current knowledge on wrought iron, alloy steels, nonferrous metals, fatigue of materials, effect of mechanical work on the properties of steel, heat treatment of steel, and effects of temperature on the properties of metals. (A general)

288-A. (Book.) **Metals Handbook, 1954 Supplement.** Taylor Lyman and Carl H. Gerlach, editors. 184 p. 1954. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. $5.00.

Reports of 22 committees on topics representing fields of greatest advancement since 1948. Individual reports were previously abstracted from the July 15, 1954 issue of *Metal Progress*. (A general)

289-A. (Book.) **Procedures for Analyzing Metal-Finishing Wastes.** Metal-Finishing Industry Action Committee. 102 p. 1954. Ohio River Valley Water Sanitation Commission, 414 Walnut St., Cincinnati 2, Ohio. $1.00.

Jointly tested and approved methods for cyanides and metals, adapted methods, and methods for over-all examination. (A8, L general, S11)

290-A. (Book.) **Reports on the Progress of Applied Chemistry.** F. Clark, editor. v. XXXVIII. 989 p. 1953. Society of Chemical Industry, 56 Victoria St., London S.W.1, England.

Total of 41 papers including six on development in iron and steel production; physical metallurgy, extraction, and refining of nonferrous metals; corrosion; refractories; and electrometallurgical industries of Great Britain. Papers are individually abstracted. (A general)

291-A. (Book.) **Yearbook of the American Iron and Steel Institute.** 302 p. 1954. American Iron and Steel Institute, 350 Fifth Ave., New York 1, N. Y.

Contains 20 papers on various phases of the steel industry, individually abstracted. (A general, ST)

292-A. (Book-German.) **(History of Iron.) Geschichte des Eisens.** Otto Johannsen. 622 p. 1953. Verlag Stahleisen, Düsseldorf, Germany. DM 75.

Review of development of the iron and steel industry with emphasis on German, Austrian, and Scandinavian contributions. (A2, Fe, ST)

SECTION B

RAW MATERIALS and ORE PREPARATION

1-B. Factors Controlling the Rate of Sinter Production. E. W. Voice, S. H. Brooks, W. Davies and B. L. Robertson. *Iron and Steel Institute. Journal,* v. 175, Oct. 1953, p. 97-152 + 3 plates.

Equipment, plant layout and operating procedures. Quality of sinters and methods of increasing production. Diagrams, tables, graphs, photographs. 22 ref. (B16)

2-B. Towards Faster Sintering of Ironstone. M. A. K. Grice and W. Davies. *Iron and Steel Institute, Journal,* v. 175, Oct. 1953, p. 155-160 + 1 plate.

Output closely related to airflow may be increased by partial pelletizing of feed in drum mixer. Further benefit may be derived from delaying addition of coke until later stage in mixing. Graphs, table, photographs, diagram. 3 ref. (B16)

3-B. Radiographic Studies of the Process of Sintering Iron Ores. E. Cohen. *Iron and Steel Institute, Journal,* v. 175, Oct. 1953, p. 160-166 + 6 plates.

Minerological nature of sinters and desirable properties. Differences in structure and their relation to sintering process. Tables, photographs. 8 ref. (B16)

4-B. Impact Crushing. L. Ackerman. *Mining Magazine,* v. 89, Oct. 1953, p. 201-212.

Recent crushing tests on Tarkwaian and Witwatersrand quartzites and results. Tables, diagrams. 12 ref. (B13, Au)

5-B. Ilmenite in Egypt. B. W. Holman. *Mining Magazine,* v. 89, Oct. 1953, p. 212-216.

Tests carried out on ore from Wadi-Ranga deposit. Diagram, tables. (B11, Ti)

6-B. (Portuguese.) **Herty Fluidity of Lead Reduction Slags.** Tharcisio D. de Souza Santos. *ABM (Boletim da associacao brasileira de metais),* v. 9, no. 31, Apr. 1953, p. 261-289.

Experimental investigation on 97 different compositions. Tables, graphs. 7 ref. (B21, Pb)

7-B. The Sullivan Concentrator. *Mine & Quarry Engineering,* v. 19, Nov. 1953, p. 386-395.

Equipment, plant layout and operating procedures. Photographs, diagrams, tables. 1 ref. (B14, Pb, Zn, Fe)

8-B. The Mineralogy of Blast Furnace Sinter. Hobart M. Kraner. *Mining Engineering,* v. 5, Nov. 1953, *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 196, 1953, p. 1114-1117.

Composition of sintered iron ores. Graphs, tables. 28 ref. (B16, Fe)

9-B. Kaiser Mills Nevada Fluorspar. *Mining World,* v. 15, Nov. 1953, p. 38-41.

Equipment, layout and operating procedures of plant for milling and concentrating cryolite. Photographs, table. (B14)

10-B. Tungsten Mining Corporation's Expanded Mill. Howard L. Waldron and Lewis J. Walters. *Mining World,* v. 15, Nov. 1953, p. 42-46.

Facilities and procedures for concentrating tungsten ores. Photographs, graph, flowsheet. (B14, W)

11-B. From Africa Comes Cobalt. *Mining World,* v. 15, Nov. 1953, p. 48-52.

Cobalt mines, mills and methods of concentrating cobalt ores. Photographs, map, graph. (B10, B14, Co)

12-B. Uranium-Mining Operations of the Utex Exploration Co. in the Big Indian District, San Juan County, Utah. Charles A. Steen, George P. Dix, Jr., Scott W. Hazen, Jr., and Russell R. McLellan. *U. S. Bureau of Mines, Information Circular* no. 7669, Oct. 1953, 13 p.

Development and production methods. Tables, maps, photographs. (B general, U)

13-B. (German.) **Ore Beneficiation in Yugoslavia.** Werner Gründer. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 6, no. 10, Oct. 1953, p. 388-394.

Mining and concentration of molybdenum and copper ores. Maps, diagrams, graphs. 4 ref. (To be continued.) (B14, Cu, Mo)

14-B. Ammonia Pressure Leach Process for Recovering Nickel, Copper, and Cobalt From Sherritt Gordon Nickel Sulphide Concentrate. F. A. Forward. *Canadian Mining and Metallurgical Bulletin,* v. 46, no. 499, Nov. 1953, p. 677-684; disc., p. 684; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 61, 1953, p. 363-370.

Details of work carried out in laboratories and pilot plants. Indicates initial costs of development. Predicts savings from adoption of process. Table, diagram, graphs. (B14, Co, Cu, Ni)

15-B. The Rating of Sinter Plants for Economic Output. R. F. Jennings. *Iron and Steel Institute, Journal,* v. 175, Nov. 1953, p. 248-256.

Major problems in designing sintering equipment to give maximum output at minimum costs. Graphs, tables. 6 ref. (B16, Fe)

16-B. Sinter-Plant Assessment Trials at Dagenham and at Cleveland. R. F. Jennings, E. W. Voice, P. K. Gledhill, G. C. Carter and C. F. Ely. *Iron and Steel Institute, Journal,* v. 175, Nov. 1953, p. 267-277.

Equipment, plant layout and operating procedures. Diagrams, tables. (B16, Fe)

17-B. Effect of Mineral Additions and Moisture Control on the Sintering of Sierra Leone Concentrates. P. K. Gledhill, G. C. Carter, and C. F. Ely. *Iron and Steel Institute, Journal,* v. 175, Nov. 1953, p. 277-279.

Addition of lime and lime-bearing materials resulted in a decrease in sintering time and reduction in air requirements, with no appreciable change in permeability. Graphs, table. 4 ref. (B16, Fe)

18-B. Sintering as a Physical Process. H. B. Wendeborn. *Iron and Steel Institute, Journal,* v. 175, Nov. 1953, p. 280-288.

Down-draft sintering process, heat transfer by gas and air during sintering, and reactions and heat transfer in the sinter bed. Heat balance examples. Tables, diagrams. 8 ref. (B16, Fe)

19-B. (English.) **Fundamental Researches on Metallurgical Treatment of Manganese Ores. I. On the Equilibrium in the Reduction of Mn_3O_4 With CO.** Tomimatu Isihara and Akiichi Kigoshi. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 2, Apr. 1953, p. 172-178.

Equilibrium in the reduction, $Mn_3O_4+CO=3MnO+CO$. Diagrams, graphs. 11 ref. (B14, Mn)

20-B. (English.) **Studies on Pyrrhotite. I. Combustibility of Pyrrhotite.** Masuteru Maruyama. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 3, June 1953, p. 208-217.

Roasting reaction rates and the relations between the roasting reactions and the roasting temperatures. Graphs, tables. (B15, Fe)

21-B. (Russian.) **Influences of Gases on the Density of Absorbed Layer of Sodium Oleate During Flotation of Certain Nonsulfide Minerals.** I. N. Plaksin and E. M. Chaplygina. *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 301-303.

Explains the better floatability of investigated minerals. Graphs. 4 ref. (B14)

22-B. Cobalt at Fredericktown. George P. Lutjen. *Engineering and Mining Journal,* v. 154, Dec. 1953, p. 72-76.

Equipment, plant layout and operating procedures. Photographs, diagram. (B10, Co)

23-B. Sintering Zinc Concentrates on the Blackwell 12 by 168 Ft. Machine. A. E. Lee, Jr. *Journal of Metals,* v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1631-1633.

Machine and its operation; performance data. Diagram, photograph. 3 ref. (B16, Zn)

24-B. E&MJ Visits the General Superintendent at U. S.' Largest Titanium Mine. John H. Kearney and George P. Lutjen. *Engineering and Mining Journal,* v. 154, Dec. 1953, p. 83-88.

Equipment, plant layout and operating procedure. Photographs. (B12, Ti)

25-B. (Hungarian.) **Production and Properties of Alloying Materials Necessary for the Manufacture of Manganese-Aluminum Alloys.** Andras Domony and Rezso Varhelyi. *Aluminium (Budapest),* v. 5, no. 11, Nov. 1953, p. 236-241.

Emphasis on the importance of keeping out iron. Practical details of various processes. Micrograph, tables, graphs. 10 ref. (B general, Mn, Al)

26-B. (Russian.) **Phase Composition of Certain Calcium-Chromium Slags and Particularly the Characteristic Water-Soluble Calcium in Them.** D. S. Biliankin and V. V. Lapin. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 911-914 + 1 plate.
Various chromium - containing slags were investigated. Micrograph, tables. 6 ref. (B21, Cr)

27-B. **Sinter for Open Hearth Charge.** E. G. Hill. *Blast Furnace and Steel Plant,* v. 41, Dec. 1953, p. 1434-1436, 1438.
Need and use of sinter and its manufacture. Tables. (B16)

28-B. **Erie Starts Big Taconite Project.** *Steel,* v. 133, Dec. 14, 1953, p. 82.
Financing plans completed for program aimed at producing 10.5 million tons annually. (B16, Fe)

29-B. **Mineral-Dressing Study of Manganese Ore, Cason Mine, Batesville, Ark.** M. M. Fine and D. W. Frommer. *U. S. Bureau of Mines, Report of Investigations* 5005, Oct. 1953, 9 p.
Investigations made on button and carbonate ores to determine degree of concentration that could be effected by modern methods. Tables. 5 ref. (B14, Mn)

30-B. (French.) **Industrial Tests Conducted at Kahlenberg, Germany, for the Enrichment of a Lorraine Ore by High Intensity Magnetic Separation.** L. Coche. *Institut de Recherches de la Sidérurgie, Publications,* ser. A, no. 58, July 1953, 15 p.
Results of tests with Mont-Saint-Martin fines indicate need for careful crushing of ore to lessen amount of very fine particles and need for careful adjustment of apparatus. Tests showed it was possible to eliminate more than half of the gangue while losing only 10% of the iron. Describes installations. Diagrams, tables, photographs. (B13, Fe)

31-B. (French.) **Magnetizing-Roasting Tests on French Iron Ores.** P. Emery and J. Givaudon. *Institut de Recherches de la Sidérurgie, Publications,* ser. A, no. 60, Oct. 1953, 119 p.
Tests on low-grade siliceous Micheville ore and Mont-Saint-Martin ore in the Iron and Steel Research Institute reactor and tests of the latter ore in a tray furnace. Fluidization phenomena. Tables, graphs, diagrams. (B14, B15, Fe)

32-B. (Hungarian.) **The Enriching of Manganese Mud With Simultaneous Desulfurization of Generator Gas. II.** *Kohaszati Lapok,* v. 8, no. 8, Aug. 1953, p. 165-168.
Construction and operation of a pilot plant built for determining absorption of sulfur from generator gas by means of manganese mud under industrial conditions. Manufacturing plan developed on the basis of observations. Technology of application to various muds and ores. Diagram, photograph. 13 ref. (B22, Mn)

33-B. (Russian.) **Intensification of Flotation Processing of Sulfide Minerals.** I. I. Zozulia. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 7, July, p. 964-968.
Wettability of surface can be effectively changed by means of gases formed in electrolytic dissociation of water directly in the pulp. Graphs, diagrams. 2 ref. (B14)

34-B. (Russian.) **Viscosity Mechanism of Blast-Furnace Slag.** A. M. Chernyshev, L. M. Tsylev, and A. V. Rudneva. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 7, July, p. 1044-1057.
Viscosity of slag determined by measurements of complex silicate slag ions. Tables, graphs. 10 ref. (B21)

35-B. **How and Why Solids Agglomerate.** Carl Ludwig. *Chemical Engineering,* v. 61, Jan. 1954, p. 156-160.
Includes table, diagrams, photographs. (B14)

36-B. **Scrap Preparation Program Improves Steel Quality.** E. W. Hunziker. *Iron Age,* v. 172, Dec. 17, 1953, p. 132-136.
If purchased scrap is poorly prepared and segregated, quality and cost of steelmaking suffers. A positive program to improve scrap preparation combines efforts of dealers and consumers. Photographs, graphs. (B22, ST)

37-B. **Ore Handling and Crushing System for Orinoco Mining Company —Puerto Ordaz, Venezuela.** L. O. Millard. *Mines Magazine,* v. 43, Nov. 1953, p. 19-22.
Equipment, plant layout and operating procedures. Diagrams, photographs. (B13, A5, Fe)

38-B. **Skubic Brothers Concentrator on Mesabi Iron Range.** A. Tancig. *Skillings' Mining Review,* v. 42, Dec. 19, 1953, p. 1-2.
Equipment, plant layout and operating procedures. Photograph, flowsheet. (B14)

39-B. **Dealer Program for Purchased Scrap Improves Quality, Rate of Production at USS Plant.** E. W. Hunziker. *Western Metals,* v. 11, Dec. 1953, p. 65-68.

Scrap preparation and effect of scrap characteristics on quality and rate of production of finished steel. Photographs, graph. (B22, D general, ST)

40-B. (Book.) **Manganese in the Iron and Steel Industry: Use, Recovery and Supplies. Organization for European Economic Cooperation.** Her Majesty's Stationery Office, London. 3s. 6d.

Need for plentiful supplies of manganese in British iron and steel industry; briefly suggests means of conservation. (B22, D general, Mn)

41-B. Flotation. Robert B. Booth. *Industrial and Engineering Chemistry,* v. 46, Jan. 1954, p. 105-111.

Developments in sulfide and oxide metallic ores and nonmetallics including coal. 81 ref. (B14)

42-B. Leaching. Robert A. Ebel. *Industrial and Engineering Chemistry,* v. 46, Jan. 1954, p. 126-129.

Pilot plant developments of both new processes and new equipment. Work has been done predominantly in sugar, metallurgical and oilseed industries. 88 ref. (B14)

43-B. Iron Ores. A. Grieve. *Iron & Steel,* v. 26, Dec. 11, 1953, p. 617-620; disc., p. 663-666.

Paper from the Symposium on Sintering, following the Iron and Steel Institute, Autumn General Meeting, 1953. Results of experimental studies of softening at high temperatures. Tables, graphs. (B16, Fe)

44-B. Blast-Furnace Raw Materials. E. W. Nixon and F. R. Maw. *Iron & Steel,* v. 26, Dec. 11, 1953, p. 643-645; disc., p. 666-671.

Paper from the Symposium on Sintering, following the Iron and Steel Institute, Autumn General Meeting, 1953. Materials, apparatus and techniques for permeability tests. Graphs. (B16, B22, Fe)

45-B. Sintering Practice at Domnarfvet. Christer Danielsson. *Iron & Steel,* v. 26, Dec. 11, 1953, p. 654-655; disc. p. 672-674.

Paper from the Symposium on Sintering following the Iron and Steel Institute, Autumn General Meeting, 1953. Raw materials, equipment, practices and production. Table, graph. (B16, Fe)

46-B. Activities of Constituents of Iron and Steelmaking Slags. II. Manganous Oxide. III. Posphorus Pentoxide. E. T. Turkdogan and J. Pearson. *Iron and Steel Institute, Journal,* v. 175, Dec. 1953, p. 393-398.

Equilibrium constant of manganese reaction has been calculated and used, in conjunction with ferrous oxide activity diagram from part I, to evaluate activity of manganous oxide in MnO-FeO-SiO_2 and some basic steelmaking slags. Graphs, diagrams. 12 ref. (B21, D general, P12, Fe)

47-B. Effect of Gangue Size on Flotation. George W. Mao. *Mines Magazine,* v. 43, Dec. 1953, p. 23-26, 28, 42.

Effects of particle size on flotation and hypotheses of slime-coating mechanism. Tables, graphs. 11 ref. (B14)

48-B. Study of Slags With High Titanium Content. W. Freundlich. Henry Brutcher, Altadena, Cal., Translation no. 3005, 27 p. + 3 plates. (From *Bulletin de la société chimique de France,* 1952, May-June, p. 655-663.)

Previously abstracted from original. See item 320-B, 1952. (B21, Ti)

49-B. Viscosity Measurements of Synthetic Slags in FeO-SiO_2-TiO_2 System. G. Urbain. Henry Brutcher, Altadena, Cal., Translation no. 3068, 4 p. + 1 plate. (From *Comptes rendus,* v. 232, p. 330-332.)

Viscosity determinations in Armco-iron crucible by principle of damped oscillations. Diagram, graphs. 4 ref. (B21)

50-B. (German.) **The Production of Lead From Ores, Residues and Scrap.** P. O. Poettken. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 886-892.

Beneficiation, roasting and smelting of ores, refining crude metal, and old and new methods of extracting silver. Diagrams, photographs. 5 ref. (B14, B15, C21, A8, Pb, Ag)

51-B. (Hungarian.) **Opening Speech of Undersecretary Bese Vilmos, at the Bauxite-Alumina Meeting at Ajka, on June 20-21, 1953.** *Aluminium (Budapest),* v. 5, no. 10, Oct. 1953, p. 205-207.

Future tasks of bauxite and alumina industry in Hungary. Maintaining quality of bauxite, discovering new high-quality bauxite deposits, developing technology of existing plants, effecting savings in electrical power consumption, training the labor force and improving quality of aluminum produced. (B10, B14, Al)

52-B. (Hungarian.) **Problems of Quality in Bauxite Production.** Endre Alliquander. *Aluminium (Budapest),* v. 5, no. 10, Oct. 1953, p. 208-213.

Methods by which quality of bauxite can be established. Measures necessary for evaluating Hungarian bauxite deposits including revision of modulus system introduced from Russia. Future possibilities and difficulties in bauxite production and processing. (B10, B14, Al)

53-B. Recovery of Manganese From Low-Grade Ores. Louis N. Allen, Jr. *Chemical Engineering Progress,* v. 50, Jan. 1954, p. 9-13.

Process in which low-grade manganese concentrates are chemically treated to make high-grade manganese oxide product. Diagram, photographs, tables. 1 ref. (B14, Mn)

54-B. Erie Ready to Start Work on Big Taconite Project. Elton Hoyt. *Engineering and Mining Journal,* v. 155, Jan. 1954, p. 78-79.

New plant will concentrate and pelletize Mesabi taconite. Photograph. (B14, B16)

55-B. Differential Grinding in Cyclone Shown by Screen Tests. Stephen E. Erickson. *Engineering and Mining Journal,* v. 155, Jan. 1954, p. 95, 168.

Results with Mesabi intermediate ore before and after passing through 6-in. unit show definite effects. Tables, diagram. (B13, Fe)

56-B. Ferrocoke. A. R. Myhill. *Mechanical World and Engineering Record,* v. 134, Jan. 1954, p. 36-37.

A new development which produces a coke-iron combination ready for charging into the furnace. (B22)

57-B. The Influence of Frothers Upon the Grade of Flotation Concentrates. S. A. Wrobel. *Mine & Quarry Engineering,* v. 20, Jan. 1954, p. 32-38.

Laboratory results showing both recovery and purity of flotation concentrates are influenced by frother used. Tables, graphs. (B14)

58-B. Developments for Increased Production at Climax. John M. Petty. *Mining Congress Journal,* v. 40, Jan. 1954, p. 24-29.

From Climax, near Fremont Pass, Colo., comes a major portion of the world's molybdenum. Improved equipment, methods and controls helped achieve and maintain daily production of 10,000 to 12,000 tons. Photographs, diagrams. (B general, Mo)

59-B. Methods of Processing Uranium Ores. S. J. Swainson. *Mining Congress Journal,* v. 40, Jan. 1954, p. 48-50.

Plant design depends on ore to be treated but basic steps are similar. Photographs. (B general, U)

60-B. How Getchell Gold Mill Recovers Tungsten. *Mining World,* v. 16, Jan. 1954, p. 38-42.

The Getchell mill, formerly a gold producer, is an excellent example of conversion of existing mills to tungsten concentration. Table, flowsheets, photographs. (B13, B14, W, Au)

61-B. The Third Sir Julius Wernher Memorial Lecture: Radioactivity in Mineral Dressing. A. M. Gaudin. Paper from "Recent Developments in Mineral Dressing, Symposium," p. xv-xxvii, Sept. 1952. Institute of Mining and Metallurgy, London, England.

Ways in which radioactivity can be made to serve the purposes of the mineral engineer, in research in operative control and in the development of new mineral separating processes. (B14)

62-B. Purpose in Fine Sizing and Comparison of Methods. E. J. Pryor, H. N. Blyth and A. Eldridge. Paper from "Recent Developments in Mineral Dressing, Symposium," p. 11-30; disc., p. 85-97 + 3 plates. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Each method gave results well within the limits of experimental error of normal head-sampling and of cutting test samples of ores used. Sedimentation method (breaker decantation) gave best results on material used in tests described. Graphs, tables, diagram. (B13)

63-B. Fundamental Principles of Sub-Sieve Particle Size Measurement. H. Heywood. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 31-58; disc., p. 85-97 + 1 plate. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Fundamental principles underlying sedimentation processes in form suitable for a critical analysis of the manifold applications of particle motion in fluids to industrial problems. Diagrams, tables, graphs. 11 ref. (B13)

64-B. The Technique of Particle Size Analysis in the Sub-Sieve Range. G. Lowrie Fairs. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 59-74; disc., p. 85-97 + 1 plate. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Four selected methods of size analysis. Tables, diagrams. 8 ref. (B11)

65-B. Release Analysis, A New Tool for Ore Dressing Research. C. C. Dell. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 75-84; disc., p. 85-97. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Technique of 'release analysis' has so far been carried out only with Mufulira copper ore, but it is believed that it will find general application elsewhere to the problem of dealing with middlings and possibly even to separation methods other than flotation. Graphs, tables, diagram. (B14, Cu)

66-B. Mathematics of Crushing and Grinding. Fred C. Bond. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 101-115; disc., p. 163-180. Sept. 1952. Institute of Mining and Metallurgy, London, England.

New theory of comminution which states that the total work input represented by a given weight of a crushed or ground product is inversely proportional to the square root of the diameter of the product particles. 8 ref. (B13)

67-B. A Method of Assessing the Grinding Efficiency of Industrial Equipment. W. F. Carey and C. J. Stairmand. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 117-136; disc., p. 163-180 + 1 plate. Sept. 1952. Institute of Mining and Metallurgy, London, England.

The associated energy concept provides a yardstick by means of which a practical value may be obtained for the grinding efficiency of industrial mills. Tests have been carried out on a number of installed mills and net grinding efficiencies ranging from 6 to 36% have been observed. Graphs, tables. 6 ref. (B13)

68-B. Defining the Scope of the Open Circuit Rod-Mill in Comminution. J. F. Myers. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 137-150; disc., p. 163-180 + 1 plate. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Includes diagrams, tables. (B13)

69-B. Crushing and Screening in Mineral Dressing Plants. G. J. Brown. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 151-162; disc., p. 163-180 + 3 plates. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Developments in crushers and screens, selection of crusher to suit the ore and importance of screen analysis. Diagrams. (B13)

70-B. Recent Developments in Classification and Fluidization as Applications of the Principles of Particle Dynamics. J. V. N. Dorr and F. L. Bosqui. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 185-204; disc., p. 205-207 + 2 plates. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Latest developments in classification and 'FluoSolids' technique. Attempts to illustrate two unit processes, diverse as regards objective, but basically related as applications of the principles underlying particle dynamics. Tables, diagram. 24 ref. (B14)

71-B. A Study of the Motion of Solid Particles in a Hydraulic Cyclone. D. F. Kelsall. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 209-227; disc., p. 247-256 + 4 plates. Institute of Mining and Metallurgy, London, England.

Optical method of solid particles within an operating cyclone has thrown new light on mechanism of particle separation and revealed undesirable flows which reduce efficiency. Graphs, table, diagram. 14 ref. (B14)

72-B. The Hydrocyclone, Its Application and Its Explanation. F. J. Fontein and I. C. Dijksman. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 229-246; disc., p. 247-256. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Survey of the most essential fields of application known at present time. A general insight into the operation of the cyclone is provided. Diagrams, graphs, tables. 8 ref. (B14)

73-B. Major Alterations in Heavy Media Separation Practice During Recent Years. K. A. Fern. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 271-278; disc., p. 288-295. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Originally developed in treatment of lead-zinc ores, and of iron ores, the heavy media separation process is now being used to treat a wide range of metallic and nonmetallic minerals, from diamonds at one end of the scale to gravel at the other. Tables. (B14)

74-B. Recent Developments in Plant Design for Dense Medium Processes. F. J. Trotter. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 279-287; disc., p. 288-295. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Continuous progress has been made during the past two decades in developing dense medium separation into a firmly established method of ore concentration. In its infancy the process was at best looked upon as an effective substitute for jigging, but its considerably wider scope has now been fully recognized and has led to a large number of applications where jigging could not be applied at all. (B14)

75-B. Recent Developments in Gravity Concentration. F. B. Michell. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 261-269; disc., p. 288-295 + 1 plate. Sept.

1952. Institute of Mining and Metallurgy, London, England.

It now appears that flotation may be losing some of its pre-eminence as a dressing method and leaching is being examined more closely than heretofore. As a result, there may be a revival of gravity methods for a rough concentration of some ores and as a preliminary to the adoption of leaching techniques. Diagrams. 6 ref. (B14)

76-B. Concentrating Ores by Pneumatic Tables. E. A. Knapp. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 299-311; disc., p. 321-323 + 2 plates. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Results in tabular form on samples of various ores. In practice cleaner concentrate could be produced as the line of concentrate would be larger. Tables, flowsheets. 10 ref. (B14)

77-B. Concentration of Eluvial or Co-Eluvial Deposits in Arid Areas. E. A. Knapp and C. T. Sweet. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 313-320; disc., p. 321-323 + 1 plate. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Progress in further development of machine for concentration of minerals by dry methods. Tables, diagrams. (B14)

78-B. Magnetic Separation Applied to Mineral Dressing. T. G. Hawker. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 325-334; disc., p. 349-357 + 4 plates. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Modern types of magnetic separators. Future trends. Graph, tables, diagram. (B14)

79-B. Electrostatic Separation. S. B. Hudson. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 335-348; disc., p. 349-357. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Principles and properties of the plate-type separator. Tests on the separation of zircon and rutile. Tables, graphs. 7 ref. (B14, Zr, Ru)

80-B. Photometric Separation of Ores in Lump Form. P. C. Newman and P. F. Whelan. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 359-381; disc., p. 382-383 + 1 plate. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Barytes, bauxite, blue marl, calcite, chromite, fluorspar, gypsum, limestone, magnesite, pyrite, witherite and witherite gangue were tested. Diagrams, tables, graphs. (B14)

81-B. The Relation of Crystal Lattice Discontinuities to Mineral Dressing. A. J. E. Welch. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 387-392; disc., p. 423-430. Sept. 1952. Institute of Mining and Metallurgy, London, England.

How fundamental processes of mineral dressing may be influenced by characteristic properties of crystal lattices. (B13, M26)

82-B. Selective Flotation of Metals and Minerals. J. H. Schulman. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 393-413; disc., p. 423-430. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Adsorption of agents used in monolayer experiments, onto metal and mineral powders, has been investigated quantitatively. This necessitated area determinations of the powder and measurement of small changes in concentration of solutions of the agent. Graphs, diagrams, tables. 17 ref. (B14)

83-B. The Surface Chemistry of Flotation. Nathaniel Arbiter. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 415-422; disc., p. 423-430. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Structure of the interface, thermodynamics of surface reactions and wetting effects. 27 ref. (B14, P10)

84-B. Flotation Frothers, Their Action, Composition, Properties and Structure. S. A. Wrobel. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 431-450; disc., p. 451-454. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Several of the more important specific characteristics of flotation frothers and their dependance upon molecular structure and constitution correlated and discussed. Diagrams, tables. 33 ref. (B14)

85-B. The Process of Bubble-Mineral Attachment. L. F. Evans and W. E. Ewers. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 457-463; disc., p. 464. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Theory at the collision process, experimental measurements on flotation and allied systems and experimental studies on thinning over hydrophilic and hydrophobic surfaces. Diagrams. 8 ref. (B14)

86-B. Radioactive Isotopes in Mineral Dressing Research, With Particular Reference to Flotation. John S. Carr. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 465-498; disc., p. 499-501. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Radioactivity has been discussed in detail in current literature. Certain aspects presented as an introduction to the discussion of the mineral dressing applications. Tables, diagram. 88 ref. (B14, S19)

87-B. The Application of Electrochemical Methods to Flotation Research. S. G. Salamy and J. C. Nixon. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 503-516; disc., p. 517-518. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Results show that the reactions at a mercury surface in the presence of xanthates are governed by dissociation constants of complex ions and by solubility products of collector-metal compounds at the surface. Graphs. 15 ref. (B14)

88-B. Effects of Soluble Sulphide in the Flotation of Secondary Lead Minerals. M. G. Fleming. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 521-548; disc., p. 549-554. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Technical investigation of ore from the Abenab West mine of the South West Africa Co., Ltd. Graphs, tables, diagram. 37 ref. (B14, Pb)

89-B. Some Aspects of the Flotation of Oxidized Minerals. E. J. Pryor. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 555-566; disc., p. 567-570. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Importance of dissolved salts in the mill pulp, fatty acids and frothing and froth texture. Table, diagram. (B14)

90-B. The Flotation of Oxidized Zinc Ores. Maurice Rey and Paul Raffinot. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 571-576; disc. p. 577-579. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Mineralogy of and collecting reagents for oxidized zinc materials, milling plants and results of tests. 9 ref. (B14, Zn)

91-B. Arsenic and Antimony Sulphide Minerals in Cyanidation. N. Hedley and H. Tabachnick. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 583-602; disc. p. 603-607. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Present work determines relative rates of decomposition of arsenopyrite, orpiment, realgar and stibnite in cyanide solutions of various alkalinities; nature of decomposition products; effects of these minerals on rate of gold dissolution; and investigates means for correcting deleterious effects of minerals in cyanidation. Graphs, tables. 4 ref. (B14, C24, As, Sb)

92-B. The Treatment of Ore From the Gold Mines of Union Corporation, Ltd.; A Summary of Metallurgical Practice. O. A. E. Jackson. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 609-619; disc., p. 620-624. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Important functions of crushing, milling and cyanide sections of five mines in South Africa. Flowsheet, table. (B13, C24, Au)

93-B. The Heavy-Media Plant at Stripa Mine, Sweden. S. Dalhammar and P. H. Fahlström. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 627-630; disc., p. 631-632. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Includes diagram, table. (B14)

94-B. Recent Developments in Practice at the Sullivan Concentrator. H. R. Banks. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 633-640; disc., p. 641-646 + 2 plates. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Number of important changes in crushing, transportation and concentration of the ore extracted from the Sullivan mine of the Consolidated Mining and Smelting Co. of Canada, Ltd., at Kimberley, B. C., were introduced in 1949. Observations regarding effectiveness after some two years of operation. 4 ref. (B13, B14)

95-B. The Development of Milling Technique at the Boliden Mining Company. P. G. Kihlstedt. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 659-666; disc., p. 667-669. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Milling program, controlized research and a review of work accomplished. Table, diagram. (B13)

96-B. The Quemont Milling Operation. C. G. McLachlan, M. J. S. Bennett and R. L. Coleman. Paper from

"Recent Developments in Mineral Dressing, Symposium." p. 671-697; disc., p. 698-699 + 3 plates. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Milling operation of the Quemont Mining Corp., Ltd. Mineralogical association and analysis, preparation for production, crushing, conveying and grinding, copper flotation, primary zinc, pyrite and scavenging flotation circuits, copper cleaning circuit and copper concentrate handling, secondary zinc cleaning circuit and zinc concentrate handling, pyrite pretreatment circuit and cyanide and pyrite drying plants. Diagrams, tables. 6 ref. (B13, Cu, Zn)

97-B. **Design and Construction of Small Concentrators in British Columbia.** H. M. Wright. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 719-750; disc., p. 751-753 + 6 plates. Sept. 1952. Institute of Mining and Metallurgy, London, England.

Requirements for mill design. Design and construction of six small plants in British Columbia. Tables, flowsheets. (B14)

98-B. **Significance of Mechanism and Rate of Collecting for Intensification of the Flotation Process.** V. A. Glembotskii. Henry Brutcher, Altadena, Cal., Translation no. 2542, 11 p. (From *Izvestiya Akademii Nauk SSSR, Otd. Tekh. Nauk,* 1950, no. 2, p. 253-258.)

Previously abstracted from original. See item 189-B, 1950. (B14)

99-B. (German.) **The Effect of Granulation on the Properties of Slag Sands.** Walter Kramer. *Stahl und Eisen,* v. 73, no. 24, Nov. 19, 1953, p. 1596-1600.

Experimental production of granular and spongy blast-furnace slag sands. Composition and effect of granulation on properties of brick and cement made from these slags. Diagrams, photographs, tables, graphs. (B19)

100-B. (German.) **Problems of Ore Beneficiation in Yugoslavia. III.** Werner Gründer. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 6, no. 12, Dec. 1953, p. 477-484.

Laboratory and large-scale experiments have solved important problems in beneficiation of chromium, mercury, tungsten and manganese ores. Equipment and ore-dressing methods. Tables, diagrams, graphs, micrographs. (B14, Cr, Hg, W, Mn)

101-B. (Portuguese.) **Metal Mining in Sweden and Its Geological Panorama.** Olof H. Odman. *Engenharia, mineracao e metalurgia,* v. 18, no. 107, July-Aug. 1953, p. 221-226.

Development of mining industry as a factor in Sweden's economic situation. Geological deposits. Maps, tables. (B10, B12)

102-B. (Portuguese.) **Suggestions for the Development of Mineral Production in the Northeast.** Alberto Ildefonso Erichsen. *Engenharia, mineracao e metalurgia,* v. 18, no. 107, July-Aug. 1953, p. 247-248.

Territories in Brazil which are most promising. Advocates creation of a large regional organization to carry out necessary scientific and technical studies. Photographs. (B10)

103-B. **Studies on Contact Angle Measurements & Their Application to the Concentration of Manganese Ores by Froth Flotation. I. Contact Angle Studies at the Pyrolusite Surface. II. Beneficiation of Low Grade Manganese Ores by Froth Flotation.** U. N. Bhrany and M. R. A. Rao. *Journal of Scientific & Industrial Research,* v. 12, sec. B, Dec. 1953, p. 590-604.

Experimental results. Tables, graphs. 39 ref. (B14, Mn)

104-B. **Nodulizing Iron Ores and Concentrates at Extaca.** R. L. Bennett, R. E. Hagen and M. V. Mielke. *Mining Engineering,* v. 6, Jan. 1954, p. 32-38.

Experimental kiln provides data on agglomeration of high-grade ore fines and taconite concentrates. Photographs, diagram. Graph, tables. (B16, Fe)

105-B. **Lead-Zinc Deposits of the Dunkleberg District, Granite County, Mont.** C. C. Popoff. *U. S. Bureau of Mines, Report of Investigations* 5014, Dec. 1953, 41 p. + 14 plates.

Various ore deposits in the area and conditions relative to mining of the ore. Tables, maps, diagrams. (B10, B12, Pb, Zn, Ag)

106-B. (French.) **The Place of Electrometallurgy in the Industrialization Plans of the French Territories in Africa.** *Journal du Four Electrique,* v. 62, no. 6, Nov.-Dec. 1953, p. 157-160.

Resources of bauxite, manganese, lead and zinc. Maps.
(B10, C23, Al, Mn, Pb, Zn)

107-B. (French.) **Iron and Copper Deposits of Mauritania.** Raymond Furon. *Revue générale des sciences pures et appliquées,* v. 60, nos. 9-10, 1953, p. 262-264.

Location of Cu mine discovered in 1945. Ore contained 3% metallic

copper with a known reserve of about 200,000 tons. Map.
(B10, Cu, Fe)

108-B. (Book.) **Ore Dressing Methods in Australia and Adjacent Territories. v. III.** H. H. Dunkin, editor. 317 p. Australasian Institute of Mining and Metallurgy, 399 Little Collins Street, Melbourne, Australia. £A1 7s, unbound; £A1 17s. 6d. bound

Emphasis on gold, lead, zinc, copper, tin, and tungsten ores. Some nonmetallic industrial minerals are included. (B14, Au, Pb, Zn, Cu, Sn, W)

109-B. (Book.) **Recent Developments in Mineral Dressing, Symposium.** 766 p. Sept. 1952. Institution of Mining and Metallurgy, London, England. $8.50.

A symposium arranged by the Institution of Mining and Metallurgy, held Sept. 23-25, 1952. Papers are separately abstracted. (B13, B14)

110-B. Ore Dressing. Bunting S. Crocker. *Engineering and Mining Journal,* v. 155, Feb. 1954, p. 120-122, 132-133.

Reports industry interest centers on hydrometallurgy. (B14)

111-B. Iron Ore Beneficiation. Fred D. DeVaney. *Engineering and Mining Journal,* v. 155, Feb. 1954, p. 123-125.

Taconite projects in Lake Superior region. (B14, B15, B16, Fe)

112-B. Metallurgy. A. W. Schlecten. *Engineering and Mining Journal,* v. 155, Feb. 1954, p. 126-128.

Review of 1953 literature which explains extractive processes in terms of fundamental reactions and relations.

(B general, C general, D general)

113-B. Properties of Foreign and Domestic Natural Graphites. *National Bureau of Standards, Technical News Bulletin,* v. 38, Jan. 1954, p. 5-6.

Chemical composition, thermal reactions, surface area and refractoriness of ash were determined to establish suitability for use as crucibles in nonferrous refining. Diagrams. (B19)

114-B. Progress in the Development of Refractories for Steel Manufacture. J. H. Chesters. Paper from "Ceramics. A Symposium". The British Ceramic Society, p. 637-650 + 4 plates.

Refractories of fireclay, silica, dolomite, magnesia and chrome. Photographs. 18 ref.
(B19, D general, ST)

115-B. (German.) **Study on the Process of Phase Separation of the Graphite-Mineral-Water-Oil System.** E. Weingaertner and T. K. Ghose. *Erdöl und Kohle,* v. 6, no. 12, Dec. 1953, p. 776-783.

Laws which govern Trent process of separating two or more solids by using their differential "wetting affinities" for two immiscible liquid phases. Experiments. Tables, graphs, photographs. 9 ref. (B14)

116-B. Beneficiation of Low Grade Saskatchewan Uranium Ores. I. J. O. Korchinski, G. A. Craig, S. D. Cavers and A. B. Van Cleave. *Chemistry in Canada,* v. 6, Feb. 1954, p. 34-39.

Based on paper presented to Chemical Engineering Division, Chemical Institute of Canada, 36th Annual Conference, Windsor, June 1953. Equipment, materials and methods. Map, diagram, photograph, graphs, tables. 12 ref.
(B14, U)

117-B. Preparation of Ores. J. M. McLeod. *Iron & Steel,* v. 27, Feb. 1954, p. 49-54.

Methods of improvement of blast furnace burdens. 56 ref.
(B14, B16, D1, Fe)

118-B. Chromium Distribution Between Liquid Iron and Molten Basic Slags. Nicholas J. Grant, Earl C. Roberts and John Chipman. *Journal of Metals,* v. 6, Feb. 1954, *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 145-149.

Study of distribution of chromium and oxygen between liquid iron, containing less than 1% chromium, and simple slags in temperature range 1526 to 1734° C. Graphs, photomicrographs, table. 15 ref.
(B21, Fe)

119-B. Aluminium in the British Commonwealth. *Light Metals,* v. 17, Feb. 1954, p. 39-42.

Resources and developments in power, bauxite and metal in British Isles, Canada, Africa, India and Australia. Maps. 3 ref. (B10, Al)

120-B. Grades of Lake Superior Region Iron Ore Shipped by Lake Vessel, Season 1953. *Skillings' Mining Review,* v. 42, Feb. 13, 1954, p. 1-2.

Iron ore grades and gross output. Photograph, tables. (B10)

121-B. Iron Ore to Be Recovered From Nickel Ores. *INCO,* v. 26, no. 3, p. 7-8.

New process will ultimately yield 1,000,000 tons of high-grade ore per year. Photograph.
(B general, Fe, Ni)

122-B. Developments in Minerals Beneficiation. Donald W. Scott. *Min-*

ing Engineering, v. 6, Feb. 1954, p. 166-183.

Progress in fields of crushing and grinding, screening and classification, solids-fluids separation, flotation, solution and precipitation, agglomeration and sintering. Photographs. (B14)

123-B. Flotation Characteristics of Pyrrhotite With Xanthates. C. S. Chang, Strathmore R. B. Cooke and Iwao Iwasaki. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, Feb. 1954, p. 209-217.

Effects of aeration on an aqueous suspension of pyrrhotite. Results correlated with flotation tests using xanthates as collectors. Effects of copper activation and pH variation and possible mechanisms. Graphs, micrographs, tables. 19 ref. (B14, Fe)

124-B. Flotation Theory. Molecular Interactions Between Frothers and Collectors at Solid-Liquid-Air Interfaces. J. Leja and J. H. Schulman. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, Feb. 1954, p. 221-228.

Long-chain homologs of alcohols and alkyl sulfates react strongly with xanthates at the air-liquid interface; reactions between frothers and collectors occur at the solid-liquid interface if the solid is suitably coated by collector molecules; and effects of collector-frother associations are evident in frothing and flotation tests. Diagrams, graphs, tables. 23 ref. (B14)

125-B. Transformation of Quartz in Presence of a Small Quantity of Mineralizers. I. S. Kainarskii and L. I. Karyakin. *Henry Brutcher, Altadena, Calif., Translation* no. 3190, 10 p. (From *Doklady Akademii Nauk SSSR,* v. 81, no. 5, 1951, p. 887-890.)

Microscopic study of silica brick made with iron bond and containing 98% silica after service in an openhearth furnace roof. Compares crystallization of the silica in this brick against ordinary silica brick. Table, micrographs. 3 ref. (B19)

126-B. (English.) **Diffusion of Sulfur in Molten CaO-SiO_2-Al_2O_3 Slag.** Tunezo Saito and Yasuji Kawai. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 5, Oct. 1953, p. 460-468.

As a first step in the study of kinetics of desulfurization of iron by slag, rate of diffusion of sulfur was determined by use of radioactive sulfur-35. Diffusion coefficient in an acid slag at 1440° C. was nearly the same as in a basic slag. Diagrams, graphs, tables. 3 ref. (B21, N1)

127-B. (Portuguese.) **Microstructures Observed in Sinters From the Monlevade (Brazil) Factory.** Janusz Wscieklica. *ABM (Boletim da associacao brasileira de metais),* v. 9, no. 32, July 1953, p. 332-343.

Semi self-fluxing and self-fluxing sinter data. Relationship between microstructure and quality of these two types of sinter. Table, micrographs. 5 ref. (B16, M27, Fe)

128-B. (Book.) **Ceramics. A Symposium.** A. T. Green and Gerald H. Stewart, editors. 877 p. 1953. The British Ceramic Society, Stoke-on-Trent, Staffordshire, England. £2/5.

Twenty-nine contributions, individually abstracted, grouped according to their range of interest under four principal headings. (B19, L27, H12)

129-B. The Production of Coke to Blast Furnace Specifications. James A. Beatty. *Blast Furnace and Steel Plant,* v. 42, Mar. 1954, p. 339-344.

Equipment, raw materials plant layout and processing techniques. Photographs, tables, diagrams. (B22, D1)

130-B. Modern Plant Will Treat Mesabi Lean Ores. E. C. Herkenhoff. *Engineering and Mining Journal,* v. 155, Mar. 1954, p. 78-83.

Equipment, plant layout and operating procedures. Diagrams, table, photographs. (B general, Fe)

131-B. Preparation of Ores. II. J. M. McLeod. *Iron & Steel,* v. 27, Mar. 1954, p. 103-109.

Sintering of low-grade iron ores. 55 ref. (B16, Fe)

132-B. Magnetizing Roasting of Low-Grade Iron Ores. H. Hendrickx and G. Scheibe. *Henry Brutcher, Altadena, Calif., Translation no.* 3212, 14 p. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 9-10, 1952, p. 321-324.)

Previously abstracted from original. See item 360-B, 1952. (B14, Fe)

133-B. (English.) **On the Theory and Use of the Hydrocyclone.** G. Tarjan. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 3-4, 1953, p. 389-411.

Theory of operation and advantages in coal dressing and ore beneficiation. Tables, graphs. 11 ref. (B14)

134-B. (French.) **Preparation of the Burdon of Blast Furnaces Using Lorraine Minettes.** Paul Thierry. *Métallurgie et la construction mécanique,*

v. 86, no. 2, Feb. 1954, p. 87, 89, 91.
Mixing, damping, coking, cooling and screening. Graph, diagram. (B13, D1, Fe)

135-B. (German.) **Sampling of Ores and Slags During Iron Manufacture.** Kurt Möhl. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 33-37; disc., p. 37-38.
Quantity of sample and place to secure it. Diagrams. (B11, Fe)

136-B. (Russian.) **New Discovery of Ilvaite in Copper-Nickel Sulfide Ores.** G. I. Gorbunov and N. A. Kornilov. *Doklady Akademii Nauk SSSR,* v. 94, no. 2, Jan. 11, 1954, p. 323-325 + 1 plate.
Optical properties, X-ray analysis and interrelationship with sulfides and other material. Table, micrograph. 2 ref. (B14)

137-B. (Swedish.) **The Application of Hydraulic Cyclones in Low Grade Ore Milling.** P. H. Fahlström. *Jernkontorets Annaler,* v. 138, no. 1, 1954, p. 1-16.
Theory and action of hydraulic cyclone as a classifier with experiments on specular hematite slime. Application on various ores. Diagrams, graphs, tables, photographs. 21 ref. (B13, Fe)

138-B. Upgrading Manganese Ores. Three Kids Mine, Nevada. S. J. McCarroll. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, Mar. 1954, p. 289-293.
Equipment, plant layout and processes. Photographs, tables, diagram. 6 ref. (B general, Mn)

139-B. Rare Earths Moving Fast. William E. Knapp and Wilbur T. Bolkcom. *Steel,* v. 134, Mar. 15, 1954, p. 104, 106.
Valuable properties result from addition of small quantities of rare earths to conventional alloys. Graphs, table. (B22, EG-g)

140-B. Concentration of Oxide Manganese Ores From Northeastern Nevada (Caviglia-Vietti, Berning, and Reed-Parker Deposits). G. M. Potter and R. R. Wells. *U. S. Bureau of Mines, Report of Investigations* 5023, Feb. 1954, 13 p.
Laboratory tests determine amenability to methods of concentration. Tables. (B14, Mn)

141-B. Beneficiation of Oxide Manganese and Manganese-Silver Ores From Southern Arizona. R. Havens, S. J. Hussey, J. A. McAllister and K. C. Dean. *U. S. Bureau of Mines, Report of Investigations* 5024, Feb. 1954, 30 p.
Studies to determine amenability to concentration. Tables. (B14, Mn, Ag)

142-B. Agglomeration and Beneficiation. *American Institute of Mining and Metallurgical Engineers, Proceedings,* v. 12, 1953, p. 1-103.
Includes "Beneficiation of East Texas Iron Ores", W. R. Bond; "Quality Control of Blast Furnace Flue-Dust Sinter", E. C. Rudolphy and D. J. Carney; "Reduction-Oxidation Process for the Treatment of Taconites", F. M. Stephens, Jr., Benny Langston and A. C. Richardson; and "Sintering Fans—Construction and Application", H. R. Phelps. (B14, B15, B16, Fe)

143-B. Tin Production and Resources. F. Stuart Miller. Paper from "Symposium on Tin". ASTM Special Technical Publication no. 141. p. 3-24, 1952.
Nature and distribution of ores, mining methods, production statistics. Tables. 15 ref. (B general, Sn)

144-B. (German.) **Metallurgical Behavior of Chromium Ores.** Dieter Hoenes and Georg Volkert. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 1-10.
Production of ferrochrome from various ores. Structure and refining behavior of the ores. Tables, graphs, micrographs. 7 ref. (B22, Fe, Cr)

145-B. (Italian.) **Refractory Products in Metallurgy.** Francesco Savioli. *Metallurgia italiana,* v. 46, no. 1, Jan. 1954, p. 7-14; disc., p. 14.
Summarizes 21 reports delivered at 1953 International Research Meeting organized by Belgian Association for Promotion of Research in Glass and Siliceous Compounds in Brussels. Diagrams, tables, photographs, graphs, micrograph. (B19)

146-B. The Processing Possibilities of Ultrasonics. Oskar Mattiat. *Acoustical Society of America, Journal,* v. 26, Mar. 1954, p. 241-243.
Use of ultrasonic waves in extraction, dispersion, emulsification, flotation ore dressing, soldering, drilling and cleaning. 12 ref. (B general, L12, K7, G17)

147-B. Recovery of Uranium From Canadian Ores. A. Thunaes. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 503, Mar. 1954, p. 128-131; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 60-63.
Extraction, treatment methods and influence of mineralogy. Table. (B general, U)

148-B. Fine Grinding With Screened Ore At Lake Shore Mines. Bunting S. Crocker. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 503, Mar. 1954, p. 183-196; *Canadian Institute of*

Mining and Metallurgy, v. 57, 1954, p. 115-128.

Development of process, equipment, operating procedures and testing methods. Photographs, diagrams, tables. (B13)

149-B. Progress in Sintering. Quality of Iron Ore Sinter as Related to Moisture and Coke Content. H. A. Morrissey and R. E. Powers. *Journal of Metals,* v. 6, Apr. 1954, p. 447-449.

Abstracted from paper presented at AIME Blast Furnace, Coke Oven and Raw Materials Committee Meeting, Chicago, Apr. 1954. Clarifies problems faced by sinter plant operator in attempts to produce a strong, dense, readily reducible blast furnace material. Diagram, tables. (B16, Fe)

150-B. Some Engineering Features in Modern Ore Dressing and Smelting Practice. C. C. Downie. *Mining Journal,* v. 242, Mar. 19, 1954, p. 329-330.

Dimensions and capacities of motors and concentrating, briquetting, and drying equipment. 8 ref. (B14, B17)

151-B. Homestake Rebuilds South Mill to Save Manpower and Horsepower. Nathaniel Herz. *Mining World,* v. 16, Apr. 1954, p. 40-43, 63.

Development of ore grinding by the Homestake Mining Co., Lead, S. D., from 1878 to present. Photographs. (B13, Au)

152-B. The Current Status of Cyclones as a New Classification Tool. A. J. Fischer and R. D. Forger. *Mining World,* v. 16, Apr. 1954, p. 44-47, 65.

Design and operational variables and classification cost comparisons. Photographs, tables. (B14)

153-B. (French.) **The Use of Granulated Ferromanganese.** J. G. Platon. *Revue de métallurgie,* v. 51, no. 2, Feb. 1954, p. 108.

Use in steelworks shows irregular results due to insufficient precautions to avoid loss of ferromanganese in slag. (B22, D general, ST)

154-B. (German.) **Metallurgical Problems of Alumina Production.** Hans Ginsberg. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 3, Mar. 1954, p. 93-98; disc., p. 98-99.

Problems of extracting by Bayer process. Effectiveness of 15 substances as inoculants. Metallographic and X-ray structure of bauxites. Tables, graphs, photographs, micrographs. 2 ref. (B14, Al)

155-B. Ore Dressing Research in India—1953. *Chemical & Process Engineering,* v. 35, Apr. 1954, p. 113-114.

Equipment and techniques in present use. Tables. 11 ref. (B13, B14)

156-B. How to Control Heat for Calciners. Wolf G. Bauer. *Chemical Engineering,* v. 61, May 1954, p. 193-200.

Practical considerations for effective utilization of heat for calcining minerals. Photographs, diagrams. (B15)

157-B. Preparation of Ores. III. Theory of Sintering and Testing of Materials. J. M. McLeod. *Iron & Steel,* v. 27, Apr. 1954, p. 145-151.

Critical review of published literature. 61 ref. (B16)

158-B. Aluminum-Bauxite Reserves and Production. *Light Metal Age,* v. 12, Apr. 1954, p. 20-21, 23, 31.

World statistics and developments. (B10, A4, Al)

159-B. Solid State Bonding in Iron Ore Pellets. Strathmore R. B. Cooke and Robert E. Brandt. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, Apr. 1954, p. 411-415.

Study of solid state reaction responsible for development of hard shell in conventionally fired magnetite pellets and high strength and uniform internal structure in laboratory pellets pre-oxidized before final firing. Photographs, micrographs, table, graph. 4 ref. (B16, Fe)

160-B. Flotation of Oxidized Zinc Ores. M. Rey, G. Sitia, P. Raffinot and V. Formanek. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, Apr. 1954, p. 416-420.

Fatty amines efficient for partially oxidized sulfide ores. Tables, graphs, diagram. 12 ref. (B14, Zn)

161-B. The Behaviour of Sulphur in Silicate and Aluminate Melts. C. J. B. Fincham and F. D. Richardson. *Royal Society, Proceedings,* v. 233, ser. A, Apr. 7, 1954, p. 40-62.

Manner in which sulfur atoms from gas displace oxygen atoms from silicates reveals a great deal of nature of melts. Equilibrium is of metallurgical importance, as it is basis of desulphurization by slags and plays a role in other slag processes involving sulfides. Tables, diagrams, graphs. 38 ref. (B21)

162-B. Raw Materials for Aluminum Production. D. D. Blue. *U. S. Bureau of Mines. Information Circular* 7675, Mar. 1954, 11 p.

Alumina extraction and reduction processes. Tables. (B general, Al)

163-B. The Influence of Temperature on Efficiency of Grinding. L. E. Djingheuzian. *Canadian Mining*

and Metallurgical Bulletin, v. 47, no. 504, Apr. 1954, p. 251-259; disc., p. 259-262; *Canadian Institute of Mining and Metallurgy, Transactions*, v. 57, 1954, p. 157-168.

Results of studies on solitic limestone, copper-nickel ore, silver-lead-zinc ore and quartz. Tables, graphs. 7 ref. (B13, Cu, Ni, Ag, Pb, Zn)

164-B. (Book—French.) **Metallurgy. Working of Metals. (Metallurgie. Elaboration des Metaux.)** v. II. 2nd Ed. C. Chaussin and G. Hilly. 202 p. 1954. Dunod, 92 rue Bonaparte, Paris 6, France. 880 fr.

Basic processes in extraction metallurgy including crushing, magnetic and flotation concentration; blast-furnace theory and practice; manufacture of steel and ferro-alloys; and nonferrous and powder metallurgy. (B general, C general, D general, H general)

165-B. Some Aspects on Sintering Operations and Sinter Usage. I. Douglas Joyce. *Blast Furnace and Steel Plant*, v. 42, May 1954, p. 515-520, 554.

Benefits of incorporation of sinter in blast furnace burden depend on physical and chemical properties of sinter and properties of other constituents. Tables. (B16, D1)

166-B. The Output of Gyratory Crushers. K. Gauldie. *Engineering*, v. 177, Apr. 30, 1954, p. 557-559.

Movement of material between crushing surfaces. Output mathematically calculated. Diagrams, graphs. (B13)

167-B. Effect of Si, Mn, P, Al, C, Ni, and Cu on the Mechanism of Sulphur Transfer Across a Slag-Metal Interface. K. M. Goldman, G. Derge and W. O. Philbrook. *Journal of Metals*, v. 6, May, 1954, *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, May 1954, p. 534-540.

Study of kinetics and mechanism of sulfur transfer at slag-metal interface under specified laboratory control. Graphs, tables, diagram, micrographs. 16 ref. (B21, D general, Si, Mn, Al, Ni, Cu)

168-B. New Mineral Dressing Laboratories. *Mine & Quarry Engineering*, v. 20, May 1954, p. 225-230.

Apparatus and equipment of a well-furnished laboratory. Photographs. (B14, A9)

169-B. (Hungarian.) **The Manufacture of Magnesite Brick, Chemically Bonded With Sulfate.** Arisztid Cser. *Kohaszati Lapok*, v. 9, no. 2, Feb. 1954, p. 69-71.

Effect of moisture and bonding material on hardness. Suitable for lining of steel furnaces. 3 ref. (B19, D general)

170-B. (Hungarian.) **Some Simple Investigations Concerning Foaming of Unfiltered Aluminate Liquor in Alumina Plants.** Mihaly Mariassy, Veronika H. Borsiczky and Istvan Somogyi. *Kohaszati Lapok*, v. 9, no. 2, Feb. 1954, p. 73-75.

Experiments to determine causes. Tables. 2 ref. (B14, Al)

171-B. (Hungarian.) **Qualitative Investigation of Bauxite.** Béla Lanyi. *Kohaszati Lapok*, v. 9, no. 4, Apr. 10, 1954, p. 162-172.

Behavior and quality of bauxites not indicated by the bauxite modulus. Tables, charts. (B10, Al)

172-B. (Hungarian.) **Data on Improving the Technology of the Settling of Red Mud by Means of Flour.** Endre Bogardi. *Kohaszati Lapok*, v. 9, no. 4, Apr. 10, 1954, p. 172-177.

Preparation, handling and effects of rye flour solutions used in alumina plants. Photographs, tables, micrographs, graphs. (B14, Al)

173-B. (Russian.) **Influence of Cations on Stability of Anions in Melted Slags.** O. A. Esin and B. M. Lepinskikh. *Doklady Akademii Nauk SSSR*, v. 95, no. 1, Mar. 1, 1954, p. 135-138.

Measurement of e.m.f. and temperature effects. Table, graph. 5 ref. (B21)

174-B. (Russian.) **Step-Like Nature of Thermal Dissociation Process of Siderites.** V. I. Kaurkovskii. *Zhurnal Prikladnoi Khimii*, v. 27, no. 2, Feb. 1954, p. 136-141.

Behavior of siderite during roasting. Graphs, table, diagram, micrographs. 5 ref. (B15, Fe)

175-B. Phosphatic Slime. Paul M. Tyler and W. H. Waggaman. *Industrial and Engineering Chemistry*, v. 46, May 1954, p. 1049-1056.

Problems of disposal; proposed industrial uses. Photographs, tables, diagrams. 4 ref. (B14)

176-B. Preparation of Ores. IV. J. M. McLeod. *Iron & Steel*, v. 27, May 1954, p. 185-191.

Methods of agglomerating fines, direct smelting processes such as pelletizing, briquetting, vacuum extrusion and nodulizing. (B14, B16, B17, D8, Fe)

177-B. Aspects on Pelletizing of Iron Ore Concentrates. Magnus Tigerschiöld. *Iron and Steel Institute, Journal*, v. 177, May 1954, p. 13-24.

Factors affecting performance of pelletizing method. Technical development of shaft furnace process. Micrograph, tables, diagrams, photograph. 28 ref. (B16, Fe)

178-B. The Pelletizing of Northampton Sand Ironstones by Vacuum Extrusion: The Experimental and Pilot

Plants at the Corby Works of Stewarts and Lloyds Ltd. A. Stirling. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 25-42.

Essentials of process and applications on low-grade ores. Diagrams, tables, photographs, graphs. 9 ref. (B16, Fe)

179-B. The Development of a Pelletizing Process for Fine Iron Ores. J. M. Ridgion, E. Cohen and C. Lang. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 43-63 + 4 plates.

Laboratory and pilot-scale work, vertical-shaft kilns, pellet structure and economic aspects. Photographs, diagrams, graphs, micrographs, table. 10 ref. (B16, Fe)

180-B. Aspects of Swedish Iron-Ore Concentration. P. G. Kihlstedt. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 63-75.

Survey of present conditions influencing beneficiation. Tables, graphs. 19 ref. (B14, Fe)

181-B. Additives Produce Strong and Reducible Iron Ore Sinter. R. D. Burlingame, Gust Bitsianes and T. L. Joseph. *Journal of Metals,* v. 6, Apr. 1954, p. 449-451.

Abstracted from paper presented at AIME Blast Furnace, Coke Oven and Raw Materials Committee Meeting, Chicago, Apr. 1954. Specific effect of additives on sintering process studied in relatively narrow section of sinter bed in which all variables were closely controlled. Photograph, graphs, tables. (B16, Fe)

182-B. Beneficiation Studies on a Pyrite Sample A From Alpha Mine, Wynaad, Nilgiris. G. V. Subramanya and P. I. A. Narayanan. *Journal of Scientific & Industrial Research,* v. 13, sec. B, Mar. 1954, p. 213-215.

Tabling and flotation studies determine use as source of sulfur. Tables. (B14)

183-B. Beneficiation Studies on a Pyrite Sample B From Alpha Mine, Wynaad, Nilgiris. G. V. Subramanya and P. I. A. Narayanan. *Journal of Scientific & Industrial Research,* v. 13, sec. B, Mar. 1954, p. 215-217.

Gravity and flotation methods used. Sulfur present in form of cubical pyrite. Tables. (B14)

184-B. By-Product Uranium Program. James A. Barr, Jr. *Mining Congress Journal,* v. 40, May 1954, p. 39-40.

Economic production from low-grade domestic phosphate rock. Photographs. (B general, U)

185-B. Alkaline Pressure Leaching Processes. F. A. Forward. *Mining Congress Journal,* v. 40, May 1954, p. 49-52, 77.

Operation at high pressures and temperatures speeds reactions and permits difficult separations with great economies in equipment and reagents. Photographs, diagrams. (B14, Co, U, Cu, Ni)

186-B. Taconite Beneficiation Comes of Age at Reserve's Babbitt Plant. Oscar Lee. *Mining Engineering,* v. 6, May 1954, p. 484-488.

Equipment and operation of concentrating and pelletizing plant. Photographs, tables. (B14, B16, Fe)

187-B. Flotation and the Gibbs Adsorption Equation. P. L. de Bruyn, J. T. G. Overbeek and R. Schuhmann, Jr. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, May 1954, p. 519-523.

Shows need for experimental work in surface chemistry and mineral-air interface. 20 ref. (B14)

188-B. Evaluation of Sinter Testing. E. H. Kinelski, H. A. Morrissey and R. E. Powers. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, May 1954, p. 527-533.

Various sinters and an iron ore were used to evaluate testing methods adapted to appraise sinter properties. Properties of strength and dusting were related to total porosity, slag ratio and total slag. Tables, graphs, diagrams. 15 ref. (B16, B21, Fe)

189-B. Developments in the Science of Mineral Dressing. E. F. Pryor. *Times Science Review,* 1954, Summer, p. 17-18.

Past and present mechanical and chemical methods. Includes graphite, copper and others. Photographs. (B general, Cu)

190-B. (German.) **Quartz Bricks and Blocks.** Alexander Frhr. v. Beaulieu Marconnay. *Werkstoffe und Korrosion,* v. 5, no. 4, Apr. 1954, p. 123-129.

Production and use in copper works, openhearth furnace, chemical works and specialized electric furnaces. Diagrams. 11 ref. (B19, C21, D2, D8)

191-B. (German.) **New Installations of the Mechernich Mining Co. With Special Consideration to Beneficiation.** Edgar Puffe. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 4, Apr. 1954, p. 141-152 + 2 plates.

Concentration of low-grade lead ores. Diagrams, maps, photographs, tables. 33 ref. (B14, Pb)

192-B. (Russian.) **Influence of Gaseous Medium on the Sinterability of Chromic Oxide.** P. P. Budinkov and

S. G. Tresviatskii. *Doklady Akademii Nauk SSSR,* v. 95, no. 5, Apr. 11, 1954, p. 1041-1042.

Preparation in protective atmospheres of nitrogen, argon or a vacuum. Table. 5 ref. (B16, Cr)

193-B. (Russian.) **Some Reasons for Incomplete Leaching of Gibbsite Bauxites.** S. I. Beneslavskii. *Doklady Akademii Nauk SSSR,* v. 95, no. 5, Apr. 11, 1954, p. 1077-1080 + 1 plate.

Presence of various amounts of monohydrates of aluminum in amorphous or corundum forms. Tables, graphs, micrographs, spectrogram. 9 ref. (B14, Al)

194-B. (Russian.) **Influence of Oxygen on the Flotability of Galenite and Chalcopyrite.** S. V. Bessonov and I. N. Plaksin. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 1, Jan. 1, p. 114-127.

Qualitative index of effects of oxygen on collecting agent. Table, graphs, photographs. 9 ref. (B14, Pb, Cu)

195-B. (Russian.) **Sulfurization of Manganese Dioxide by Ferrous Sulfate and Pyrite.** H. P. Diev, M. I. Kochnev, V. V. Paduchev and G. Ia. Sioridze. *Zhurnal Prikladnoi Khimii,* v. 27, no. 4, Apr. 1954, p. 356-359.

Oxidation roasting at temperatures of 500 to 600° C. permits transformation of 90 to 98% of manganese into a sulfate. Diagram, graphs, tables. 3 ref. (B15, Mn)

196-B. The Selective Reduction of Iron in Ilmenite and the Oxygen Pressure of TiO_{2-x} (Rutile). G. G. Michaud and L. M. Pidgeon. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 505, May 1954, p. 307-309; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 187-189.

Investigates oxidation of rutile phase in equilibrium with H_2-H_2O mixtures of various compositions from 1200 to 1450° K. Diagram, graphs. 8 ref. (B14, Fe, Ti)

197-B. The Significance of Agglomeration in the Mineral Industries. E. Swartzman. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 505, May 1954, p. 318-327; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 198-207.

Processes, equipment and products. Tables. 19 ref. (B14)

198-B. Pioche Makes Ferromanganese in New Electrolytic Furnace Plant. Stanley Dayton. *Mining World,* v. 16, May 1954, p. 39-41.

Operation of plant. Photographs. (B22, Fe-n)

199-B. (Russian.) **Distribution of Sulfur Between Metal and Slag From the Standpoint of the Ionic Theory.** O. Esin. *Zhurnal Prikladnoi Khimii,* v. 27, no. 5, May 1954, p. 473-479.

Effect of individual components of slag and metal. 25 ref. (B21)

200-B. (Book—German.) **(Metallurgy of Ferroalloy Production.) Die Metallurgie der Ferrolegierungen.** R. Durrer and G. Volkert, editors. 1953. Springer-Verlag, Berlin. 72.00 DM (about $16.00).

General principles of metallurgy; construction of furnaces with electrical problems; electrodes; methods of production; and outlook. (B22, Fe-n)

201-B. The Application of Fatty Chemicals to Flotation. Robert E. Baarson and John R. Parks. *American Oil Chemists' Society, Journal,* v. 31, June 1954, p. 261-266.

Use of fatty acids and their derivatives for separating mineral particles from each other in a liquid pulp by means of air bubbles. Tables. 9 ref. (B14)

202-B. Some Aspects of Sintering Operations and Sinter Usage. The Use of Sinter at Algoma Steel Corporation. Douglas Joyce. *Blast Furnace and Steel Plant,* v. 42, June 1954, p. 657-665.

Advantages, operation and production. Tables, graphs, photographs, diagrams. (B16, D general, Fe)

203-B. Iron From Jasper: Off To a Running Start. *Business Week,* 1954, no. 1294, June 19, p. 94 + 6 pages.

Operation and potentials of commercial beneficiation plant. (B14, Fe)

204-B. Ore Dressing Developments in Australia During 1953. II. H. H. Dunkin. *Chemical Engineering and Mining Review,* v. 46, no. 7, Apr. 1954, p. 271-275.

Treatment of gold, tungsten, uranium and other ores. 46 ref. (B14, Au, W, U)

205-B. Nicaro Proves Lateritic Nickel Can Be Produced Commercially. George P. Lutjen. *Engineering and Mining Journal,* v. 155, June 1954, p. 81-89.

Technical achievements in extraction of nickel. Photographs, maps, diagrams. (B general, Ni)

206-B. Current Trends in the Development and Uses of Refractories. H. K. Mitra. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 327-338.

Theoretical study and practical applications. Diagrams, table, photograph. 4 ref. (B19)

207-B. Sinter Is What You Make It. E. H. Rose and D. J. Reed. *Journal of Metals,* v. 6, June 1954, p. 740-744.

Control instruments for iron ore sinter plant, including permeability meter, draft gages and flowmeters. Photograph, graphs, table. (B16, S18, Fe)

208-B. Activities of Fe, FeO, Fe_2O_3, and CaO in Simple Slags. Hugo R. Larson and John Chipman. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, June 1954, p. 759-762.

Calculations using a modification of the ternary Gibbs-Duhem equation. Graphs, diagrams. 5 ref. (B21, P12, Fe)

209-B. Selectivity of Flotation Frothers. S. A. Wrobel. *Mine & Quarry Engineering,* v. 20, June 1954, p. 267-270.

Electrophysical aspects of separation by froth flotation. Table, diagrams. 20 ref. (B14)

210-B. The Liquid-Solid Cyclone as a Classifier in the Closed-Circuit Grinding of Concentrates. F. M. Lewis and E. C. Johnson. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, June 1954, p. 620-621.

Costs involved and operating experience. Photographs, diagram, tables. (B13)

211-B. Properties of Nonmagnetic Taconites Affecting Concentration. Donald W. Scott and Adam L. Wesner. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, June 1954, p. 635-641.

Study of 23 nonmagnetic iron-formation samples shows significance of chemical, mineral and physical properties in terms of their concentration. Tables, micrographs, diagram. 5 ref. (B14)

212-B. On the Mineralogy of the Black Mineral Anosovite in High-Titanium Slags. D. S. Belyankin and V. V. Lapin. *Henry Brutcher, Altadena, Calif., Translation no.* 3098, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 80, no. 3, 1951, p. 421-424.)

Isolation of anosovite from two titanium-containing slags. Mineralogical data and chemical analyses. Tables, micrographs. 3 ref. (B21, Ti)

213-B. (Russian.) **Utilization of Cupola Thermoanthracite for Cast Iron Melting.** E. E. Erenburg. *Liteinoe Proizvodstvo,* 1954, no. 2, Mar.-Apr., p. 24-26.

Treatment of anthracite to make satisfactory cupola fuel. (B18, E10, CI)

214-B. The Quemont Milling Operation. C. G. McLachlan, M. J. S. Bennett and R. L. Coleman. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 506, June 1954, p. 386-401; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 230-245.

Milling and concentration of copper and zinc ores. Flowsheet, photographs, tables, diagrams. 6 ref. (B13, B14, Cu, Zn)

215-B. The Operations and Plants of the Consolidated Mining and Smelting Company of Canada Limited. *Canadian Mining Journal,* v. 75, May 1954, p. 127-393.

History, organization, mining, dressing and smelting of copper, lead and zinc ores, production of byproduct chemicals and fertilizers. Photographs, graphs, diagrams, tables. (B general, C general, Cu, Pb, Zn)

216-B. Raw Materials for the Japanese Iron and Steel Industry. II. R. C. Whitehead. *Chemical Engineering and Mining Review,* v. 46, no. 7, Apr. 1954, p. 267-270.

Iron ore resources of Asia, survey of deposits, estimates of ore reserves and average grade. Tables. (To be continued.) (B10, Fe)

217-B. The Chemical Engineer in the Steel Industry. Thomas F. Reed. *Chemical Engineering Progress,* v. 50, June 1954, p. 288-290.

Chemical problems in raw materials, blast furnace practice, steel refining, coking and abatement of pollution. (B general, D general, ST)

218-B. Use of Oxygen in Steel Mills. Glenn O. Carter. *Iron and Steel Engineer,* v. 31, June 1954, p. 80-86; disc., p. 86.

Present usage in Europe and U.S. Future possibilities. Diagrams, graphs, photographs. (B22, D general, ST)

219-B. A Method of Automatic Control for Sinter-Plant Feeder Tables. S. K. Dean, W. N. Jenkins, P. K. Gledhill and A. J. Blanchard. *Iron and Steel Institute, Journal,* v. 177, June 1954, p. 220-223.

Rate of flow of material from a sinter-plant rotary feeder table controlled by using Simon constant-weight feeder (a weighing conveyer) to control table speed. Photograph, diagrams, graphs. 2 ref. (B16)

220-B. Iron Ore the Hard Way. *Westinghouse Engineer,* v. 14, July 1954, p. 130-134.

Review of winning and beneficiating procedures for taconite. Costs of operations. Photographs, diagrams, chart. (B14, Fe)

221-B. Acid Pressure Leaching of Uranium Ores. F. A. Forward and J. Halpern. Paper presented at Pacific Northwest Metals and Minerals Conference of the A.I.M.E., 1954, Portland, Ore. 11 p.

Includes graphs. 5 ref. (B14, U)

222-B. The Bunker Hill-Bailey Meter Density Recorder and Controller. Alvin F. Kroll. Paper presented at Pacific Northwest Metals and Minerals Conference of the A.I.M.E., Portland, Ore. 7 p. + 5 plates.

Includes table, charts, diagram, photograph. (B14, P10)

223-B. (English.) **Molecular Interactions at the Solid-Liquid Interface With Special Reference to Flotation and Solid Particle Stabilized Emulsions.** J. H. Schulman and J. Leja. *Kolloid-Zeitschrift,* v. 136, nos. 2-3, May 1954, p. 107-119; disc., p. 119-120.

Experiments with various surface active agents employed in flotation of ores as either collectors or floaters. Tables, graphs, diagrams. 32 ref. (B14)

224-B. (German.) **Chlorination and Selective Combustion of Materials Containing Heavy Metals.** W. Kangro, F. Weingärtner and Anneliese Kolbus. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 5, May 1954, p. 202-204.

Method for separation of iron from iron-rich minerals by means of chlorination. Oxidation of chlorination products. Experimental details. Tables. (B14, Fe)

225-B. (Polish.) **Self-Fluxing Sinters of Iron Ore.** B. Sewerynski. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 2, 1954, p. 83-89.

Analysis of various mixtures shows that additions of burned lime produced best results. Strength properties depend on quality of slag-generating constituents. Diagrams, tables, charts. 11 ref. (B16, Q23, Fe)

226-B. (Czech.) **Reverse Leaching of Zinc Concentrates.** Ferdinand Kadlec. *Hutnické Listy,* v. 9, no. 5, 1954, p. 274-276.

Process uses different solubility of ZnO and silicates with slight change of H_2SO_4 concentration. Tables. (B14, Zn)

227-B. (Russian.) **Investigation of Properties of Fused Slag Components by Method of Electromotive Forces.** O. A. Esin and B. M. Lepinskikh. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 2, Feb., p. 60-66.

Technique for determining activities of CaO, MgO, Al_2O_3 and SiO_2. Possibility of using method to control composition of metallurgical slags. Tables, diagrams. 3 ref. (B21, P12)

228-B. (Russian.) **The Physics of the Crushing Process and the Mechanics of Jaw Crushers.** L. B. Lebenson. *Mekhanizatsiia Stroitelbstva,* v. 11, no. 1, Jan. 1954, p. 27-31.

Critical review of previous theories and recent hypothesis of T. I. Mukha. Diagrams. (B13)

229-B. Flash Roasting. W. H. Coates. *Fertiliser Society, Proceedings,* no. 26, 1954, p. 23-48; disc., p. 49-54.

Various processes for instantaneous decomposition of pyrites and similar sulfidic ores. Photographs, tables, diagrams, graphs. (B15)

230-B. The Nature of Ironstone Sinter. E. Maud McBriar, W. Johnson, K. W. Andrews, and W. Davies. *Iron and Steel Institute, Journal,* v. 177, July 1954, p. 316-323 + 4 plates.

Description of ore sintering procedures; changes during sintering; constitution of the sinter. Tables, diagrams, micrographs, photograph. 13 ref. (B16, Fe)

231-B. Leaching of Uranium and Vanadium Ores on the Colorado Plateau. E. J. Duggan. *Mines Magazine,* v. 44, June 1954, p. 50, 84, 86, 88.

Acid and soda ash treatment of carnotite and roscoelite ores. (B14, U, V)

232-B. Facets of Electric-Energy Uses. John D. Sullivan. *Mines Magazine,* v. 44, July 1954, p. 17-21.

Uses of electrical energy in production of chemicals, metals, and other products. Present and future industrial trends. Growth potentials of electric and other industries. 26 ref.

(B general, C general, D general)

233-B. Ironmen in Quest of Fuel. Arthur C. Bining. *Steelways,* v. 10, Aug. 1954, p. 8-11.

Historical review of fuels for ironmaking. Includes use of anthracite early in the nineteenth century and efforts to use raw bituminous coal in 1950. Photographs, diagrams. (B18)

234-B. (German.) **Sampling Ferro-Alloys and Their Ores.** Hubert Wirtz. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 225-230.

Specifications of sampling ferroalloy materials. Tables, diagrams. (B11, Fe)

235-B. (Norwegian.) **Techniques and Industrial Uses of Fluidizing.** F. C.

Collin. *Teknisk Ukeblad,* v. 101, no. 25, June 24, 1954, p. 555-560.

Principles, advantages, and limitations of different methods applied to catalytic oil cracking, water gas generating, coal coking, lime burning, and roasting of sulfide iron ores. Diagrams. 27 ref. (B15, B18, Fe)

236-B. (Russian.) **Electrochemical Investigation of Processes on the Crystal Surface of Heavy Metal Sulfides.** A. N. Zhdanova. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 5, May 1954, p. 806-809.

Processes occurring when minerals are in contact with water containing dissolved gases. Graphs. 8 ref. (B14)

237-B. (Russian.) **Reduction of Copper Oxides by Graphite.** E. P. Tatievskaia, G. I. Chufarov, and N. M. Stafeeva. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 5, May 1954, p. 843-850.

Materials, apparatus, and method of investigation. Speed of reaction in vacuum and in presence of gaseous reaction products. Diagram, graphs. 19 ref. (B14, Cu)

238-B. (Slovenian.) **Iron Ores of Macedonia.** Ciril Rekar. *Rudarsko-Metalurski Zbornik,* 1954, no. 1, p. 27-52.

Analyses and tests to determine feasibility of commercial processing of ores. (B10, Fe)

239-B. (Serbo-Croatian.) **The Imotski Bauxite Region.** Rikard Marusic. *Rudarsko-Metalurski Zbornik,* 1954, no. 1, p. 53-76.

Geographical - geological survey and analyses of bauxite deposits in remote area. Transportation problem. Maps, tables, stratigraphic chart. 4 ref. (B10, Al, Fe)

240-B. (Slovenian.) **Thermal Studies on Istrian Bauxites in Connection With Theoretical and Technical Aspects of Bauxite Calcination in Alumina Plants.** Stojan Zalar. *Rudarsko-Metalurski Zbornik,* 1954, no. 1, p. 77-95.

Behavior of several aluminum hydrates. Static and differential thermal analyses. Technological significance of calcination for plants using Bayer's process. Calcination at various temperatures. Graphs, diagram. (B14, Al)

241-B. Reaction Between a Mercury Surface and Some Flotation Reagents: An Electrochemical Study. S. G. Salamy and J. C. Nixon. *Australian Journal of Chemistry,* v. 7, May 1954, p. 146-156.

Mechanisms involved in flotation reagent-mineral reactions. Graphs. 7 ref. (B14)

242-B. Crushing and Grinding Calculations. Fred C. Bond. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 507, July 1954, p. 466-472; disc., p. 472; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 286-292.

Theoretical relationship between particle size and work input. Relations between ball mill volume, charge and grinding media. Sample calculations. Tables, graphs. 9 ref. (B13)

243-B. The Hydrocyclone in Mineral Preparation. T. R. Naylor. *Mining Magazine,* v. 91, July 1954, p. 9-15.

Applications and scope of its use as a classifier and thickener. Photographs, graphs. 11 ref. (B14)

244-B. (German.) **Kinetics and Thermodynamics of Crushing Phenomena.** I. G. F. Hüttig, H. Sales and O. Staufenberger. *Monatshefte für Chemie,* v. 85, no. 3, June 1954, p. 588-596.

Experimental and theoretical treatment. Graph, tables. 15 ref. (B13)

245-B. (Russian.) **Mineralogy of Aluminum-Barium Slags.** V. V. Lapin. *Doklady Akademii Nauk SSSR,* v. 96, no. 5, June 11, 1954, p. 1037-1039 + 1 plate.

Chemical compositions and microstructures. Tables, micrographs. 3 ref. (B21, M27, U6, Al, Ba)

246-B. Progress Report on Development of Columbium in Arkansas for 1953. V. A. Nieberlein, M. M. Fine, W. A. Calhoun and E. W. Parsons. *U. S. Bureau of Mines, Report of Investigations* 5064, July 1954, 23 p.

Determination of reserves, methods for concentrating the minerals and extracting the metal. Tables, flowsheets. 32 ref. (B10, Cb)

247-B. Petroleum Sulfonate Flotation of Beryl. S. M. Runke. *U. S. Bureau of Mines, Report of Investigations* 5067, July 1954, 19 p.

Beryl satisfactorily floated with numerous petroleum sulfonate reagents under varied conditions. Tables. 9 ref. (B14, Be)

248-B. (German.) **The Migration of Slag Constituents Into Refractory Bricks.** Kamillo Konopicky. *Stahl und Eisen,* v. 74, no. 15, July 15, 1954, p. 943-947.

Study shows slagging resistance is related to temperature gradient, porosity, interfacial forces and fluxing materials. Graphs. 25 ref. (B21, B19)

249-B. Anaconda's Nevada Project —New Approach to Copper Mining. R. H. Ramsey. *Engineering and Mining Journal,* v. 155, Aug. 1954, p. 74-92.

Equipment and operation of copper leaching plant. Photographs, tables, diagrams. (B14, Cu)

250-B. New Mexico Uranium. John B. Huttl. *Engineering and Mining Journal,* v. 155, Aug. 1954, p. 96-99.

Equipment and procedures for beneficiation of uranium ores. Photographs, diagrams. (B14, U)

251-B. New Plant Successfully Floats Michigan Jasper. Robert Cochran. *Engineering and Mining Journal,* v. 155, Aug. 1954, p. 100-104, 114.

Plant for beneficiation of taconite. Photographs, diagrams, table. (B14, Fe)

252-B. Roasting Metallic Sulphides in a Fluid Column. H. M. Cyr, C. W. Siller and T. F. Steele. *Journal of Metals,* v. 6, Aug. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 900-904.

Development of a new metallurgical roasting device. Diagrams, photograph, table. 6 ref. (B15)

253-B. Beneficiation of Low Grade Cassiterite Ore From Ranchi, Bihar. G. V. Subramanya and P. I. A. Narayanan. *Journal of Scientific & Industrial Research,* v. 13, sec. B, June 1954, p. 441-444.

About 75% recovery by jigging and tabling enables simple ore dressing methods to produce a marketable grade suitable for smelting. Tables. 7 ref. (B14, Sn)

254-B. Closed-Circuit or Open-Circuit Grinding? II. H. Börner. *Pit and Quarry,* v. 47, Aug. 1954, p. 117-120, 123-125. (Translated from *Zement-Kalk-Gips,* 1952, Aug.)

Grinding diagrams, feed rates, surface and particle size studies, grinding work. Graphs, tables. 17 ref. (B13)

255-B. Mining & Beneficiating Low Grade Iron Ores at J&L's New York Division. R. G. Fleck. *Skillings' Mining Review,* v. 43, Aug. 14, 1954, p. 1-2, 20-23.

Iron ore mining, crushing and concentration. Photographs, flowsheets. (B12, B13, B14, Fe)

256-B. Mill Users Favor Quality Refractories. Robert M. Love. *Steel,* v. 135, Aug. 16, 1954, p. 107, 110.

Advantages and trends in use of basic brick and castables. Photographs. (B19)

257-B. (English.) **On the Dissociation Pressure of Pyrite.** Tominmatu Isihara and Kingo Sudo. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 5, no. 6, Dec. 1953, p. 561-572.

Experimental and theoretical determination of roasting mechanism of pyritic ores. Tables, graphs, diagram. 32 ref. (B15, Cu)

258-B. (English.) **On the Imperfection of Magnetite From Kamaishi Mine, Iwate Prefecture, Japan.** Tsunehiko Takeuchi and Matsuo Nambu. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 1, Feb. 1954, p. 83-88.

Chemical, X-ray, magnetic and thermal test data on two grades of ores. Tables, graph, X-ray patterns. (B10, Fe)

259-B. (German.) **The Grinding Functions and the Kinetics of Crushing Processes.** G. F. Hüttig and F. Moser. *Planseeberichte für Pulvermetallurgie,* v. 2, no. 1, June 1954, p. 15-19.

Review of literature covers put-through characteristic, frequency of grain-size distribution, rate of grinding and rate of change of grain-size distribution. Table, micrographs. 11 ref. (B13)

260-B. (German.) **Method of Producing Slag Sand.** Paul Grossstück. *Stahl und Eisen,* v. 74, no. 16, July 29, 1954, p. 1011-1015.

Methods of granulation of blast furnace slag, properties resulting from different methods of granulation. Tables, graphs, diagrams. 3 ref. (B21, A8)

261-B. Cyanamid Reagents. *American Cyanamid Company, Mineral Dressing Notes no.* 20, Apr. 1954, 43 p.

Properties and uses of cyanamid chemicals in mineral processing, particularly those used in the froth flotation process. Tables. (B14)

262-B. Beneficiation of Ferruginous Manganese Ore. V. S. Gaitonde. *Indian Institute of Science, Journal,* v. 36, sec. A, July 1954, p. 170-181.

Results of magnetic separation, froth flotation and chlorination methods. Tables. 10 ref. (B14, Mn, Fe)

263-B. Sinter for Open Hearth Charge. E. G. Hill. *Industrial Heating,* v. 21, Aug. 1954, p. 1556 + 5 pages.

Production and use of sinter mixes. Sintering machine. Tables. (B16, D2, Fe)

264-B. A Practical Determination of Residence Time and Short Circuiting of Dry Solids or Solids in Slurries in Continuous Systems. R. B. Coleman and J. D. Moore. *Mines Magazine,* v. 44, Aug. 1954, p. 35-38.

Determination of maximum capacity of continuous ore beneficiation systems. Diagrams, graphs. (B14)

265-B. (German.) **The Flotation Plant Marevce/Novo Brdo in the Kosmet.** Werner Gründer. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 7, July 1954, p. 283-289.

Processes and difficulties in flotation of lead-zinc ores. Results of numerous large-scale experiments performed in 1953. Photographs, diagram, graph, map, tables. 6 ref. (B14, Pb, Zn)

266-B. (German.) **Spain's Tungsten Deposits.** Friedrich Ahlfeld. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 7, July 1954, p. 290-295.

Geological positions and conditions, mineral contents, mining and concentration practices. Map. 1 ref. (B10, B14, W)

267-B. **Some Engineering Features in Modern Ore Dressing and Smelting Practice.** C. C. Downie. *South African Mining and Engineering Journal,* v. 65, pt. 1, July 31, 1954, p. 841, 843.

Dimensions and capacities of crushers, motors and briquetting equipment. 8 ref. (B13, B17, C21)

268-B. (German.) **Plant Results in the Beneficiation of Iron Ores by the Flotation Process. A. Heavy Liquid Beneficiation of the Wet Process of the Colbrecht Ore Mine Salzgitter Aktiengesellschaft.** Arnold Goltz. **B. Previous Results From the Flotation Process of Beneficiating the Salzgitter Ores of the Morgenstern Mine.** Wolfgang Jacobs. **C. The Flotation Process of Beneficiating Siderite in the "Alte Hütte" Plant at Wissen.** Otmar Burghardt. *Stahl und Eisen,* v. 74, no. 17, Aug. 12, 1954, p. 1070-1075.

Procedures. Flow charts, graph, tables. (B14, Fe)

269-B. **Brazilian Charcoal Blast Furnace Practices.** Louis Ensch. *Blast Furnace and Steel Plant,* v. 42, Sept. 1954, p. 1053-1058.

Production of charcoal and blast furnace operation. Table, diagrams. (B18, D1, CI)

270-B. **Extraction of Uranium From Aqueous Solution by Coal and Some Other Materials.** George W. Moore. *Economic Geology,* v. 49, Sept.-Oct. 1954, p. 652-658.

Includes tables, graph. 16 ref. (B14, U)

271-B. **Metallic Recuperators in the Steel Industry.** E. A. Vierow. *Iron and Steel Engineer,* v. 31, Aug. 1954, p. 57-67; disc., p. 67-70.

Offer fuel economy and increased production. Diagrams, photographs. (B18, ST)

272-B. **Sinter-Plant Operation at Appleby-Frodingham.** N. D. Macdonald. *Iron and Steel Institute, Journal,* v. 178, Sept. 1954, p. 51-60.

Development of process and equipment. Operational problems. Future plans. Diagrams. (B16, Fe)

273-B. **Report on Taconite.** Charles Baroch. *Mines Magazine,* v. 44, Sept. 1954, p. 22-23, 33, 59.

Beneficiation procedures and plants. Flowsheet. 8 ref. (B14, Fe)

274-B. **Beneficiation of Tungsten Ores.** *Mines Magazine,* v. 44, Sept. 1954, p. 24-25, 43, 54.

Froth flotation procedures. Table. 31 ref. (B14, W)

275-B. **Steel Industry Insures Its Future—With Taconite.** *Steel,* v. 135, Sept. 13, 1954, p. 76-77.

Development and potentials of the Mesabi range, mining and processing. Photographs, diagrams. (B general, Fe)

276-B. **Significance of Minor Elements in Iron Bearing Raw Materials for Integrated Steel Plants.** C. B. Jacobs, J. F. Elliott and M. Tenenbaum. Paper from "Yearbook of the American Iron and Steel Institute". American Iron and Steel Institute, p. 123-149; disc., p. 150-152.

Occurrence, behavior and influence of minor elements occurring in ores and fuels. Tables, diagram, graphs. 10 ref. (B10, B18, ST)

277-B. (Polish.) **Production of Hot Rolled Transformer Sheets of Low Watt Losses.** M. Markuszewicz, J. Groyecki and A. Zawada. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 3, 1954, p. 105-119 + 6 plates.

Use of calcium-silicon in place of about ⅓ the usual ferrosilicon produced the best electrical steel. Graphs, tables, micrographs. 40 ref. (B22, SG-q, AY)

278-B. (Russian.) **Adhesion of Sulfide Minerals to Air Bubble in Absence of Reagents.** I. N. Plaksin and S. V. Bessonov. *Doklady Akademii Nauk SSSR,* v. 97, no. 3, July 21, 1954, p. 495-498.

Change of time of adhesion of galenite and chalcopyrite under different conditions. Graphs. 9 ref. (B14, Pb, Cu, Fe)

279-B. **Slag Treatment for Conservation of Chromium.** T. W. Merrill and F. St. Vincent. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 69-73; disc., p. 73-77.

Procedures for recovery of chromium from steelmaking slags, significance and advantages of the repouring method. Tables, graphs. (B21, A8, Cr)

280-B. Substituted Starches in Amine Flotation of Iron Ore. C. S. Chang. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, Sept. 1954, p. 922-924.

Replacement of active groups in corn starch, as shown by results of the starch derivatives tested, impairs rather than improves the value of cornstarch as a selective iron oxide depressant. Increased ability to depress iron oxides is generally accompanied by a parallel ability to depress quartz. Graphs. 3 ref. (B14, Fe)

281-B. Adsorption of a Mercaptan on Zinc Minerals. A. M. Gaudin and D. L. Harris. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, Sept. 1954, p. 925-928.

Observations of the distribution of mercaptan containing S_{35} between aqueous solution and mineral and between aqueous solution and the gaseous phase. Graphs, tables. 5 ref. (B14, Zn)

282-B. Problem of Phase Composition of Some Lime-Chromium Slags With Special Consideration of the Characteristic Water-Solubility of Their Lime Component. D. S. Biliankin and V. V. Lapin. *Henry Brutcher, Altadena, Calif., Translation no.* 3305, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 91, no. 4, 1953, p. 911-914.)

Previously abstracted from original. See item 26-B, 1954. (B21, Cr)

283-B. (French.) **Progress in Studies Undertaken by the Ore Service of the IRSID and Reports of Some Tests Made Since the Last Meeting.** *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 9, 1954, p. 1675-1678.

Iron ores, magnetic roasting, high-intensity magnetic separation and concentration by flotation. 3 ref. (B10, B15, B14, Fe)

284-B. (German.) **Beneficiation of Magnetite Ore to a High Concentrate and Its Further Processing Into Sponge Iron in Persberg (Central Sweden). An Example of an Increasingly Important Process of Treating Swedish Iron Ores.** Walter Lehnert. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 9, Sept. 1954, p. 383-386.

Procedure of beneficating iron ore in a redesigned plant. Photographs, diagrams. (B14, D8, Fe)

285-B. How Slag Attacks Refractories. D. Dixon. *American Foundryman,* v. 26, Oct. 1954, p. 47-50.

Refractory melting points, effects of slag coatings, corrosion resistance of bricks and dissociation during kilning. Photographs. (B21, B19)

286-B. High-Capacity Magnetic Filter Treats Magnetite Concentrates. Bengt G. Fagerberg. *Engineering and Mining Journal,* v. 155, Oct. 1954, p. 77-79.

Equipment and operating characteristics. Diagrams, graphs, photograph, tables. (B14, Fe)

287-B. Filtration and Drying Methods in Wet Metallurgical Processes. C. C. Downie. *Mining Journal,* v. 243, Sept. 24, 1954, p. 342-343.

Vacuum filters, dryers and filtering arrangements. Details of the filtration and drying activities in the metallurgical field encompassing the drying of precipitates and crystals and rotary vacuum dryers. 9 ref. (B14)

288-B. Recovery of Ultrafine Mineral Values—a Progress Report. K. K. Kershner and A. A. Cochran. *U. S. Bureau of Mines, Report of Investigations* 5076, Sept. 1954, 7 p. + 3 plates.

Recovery of cassiterite from tin ore slimes. Tables, graphs, photograph. 9 ref. (B14, Sn)

289-B. Caustic Treatment of Zircon Sand. G. H. Beyer, D. R. Spink, J. B. West and H. A. Wilhelm. Paper from "Nuclear Engineering". American Institute of Chemical Engineers, p. 67-71.

Principle, convenience and economics of process for decomposing sand in securing zirconium for nuclear reactor structural material. Tables, diagrams. 8 ref. (B14, T25, Zr)

290-B. On the Viscosity of Blast-Furnace Slags. A. M. Chernyshev, L. M. Tsylev and A. V. Rudneva. *Henry Brutcher, Altadena, Calif., Translation no.* 3380, 21 p. (From *Izvestiya Akademii Nauk SSSR,* 1953, no. 7, July, p. 1044-1057.)

Previously abstracted from original. See item 34-B, 1954. (B21, D1)

291-B. (Norwegian.) **On the Thermodynamics of Fused Salts and Slags.** Tormod Förland. *Jernkontorets Annaler,* v. 138, no. 8, 1954, p. 455-478.

Ion exchange equilibria, activity of salt component in mixture of fused salts, formation of two liquid phases and deviation from random distribution of the ions in the mixture. Graphs, tables. 12 ref. (B21, P12)

292-B. (Polish.) **Recovery of Aluminum Oxide.** Julian Kwiatkowski. *Hutnik,* v. 21, no. 7, July 1954, p. 212-217.

Raw materials, alkali, acid and electrothermal sintering and sintering processes. Tables, diagrams. 2 ref. (B16, Al)

293-B. Rare Earths in Stainless Steels. Howard O. Beaver. *Metal Progress,* v. 66, Oct. 1954, p. 115-119.

While rare-earth oxides and misch metal are useful degasifiers in complex and high-chromium-nickel austenitic steels, residuals from misch metal are necessary to correct brittleness at forging ranges. The author has found no detrimental effects to other physical properties. Graphs, tables.
(B22, Q general, EG-g, SS)

294-B. The Five Major Advances in Nonferrous Ore Dressing. C. H. Benedict. *Mining Engineering,* v. 6, Oct. 1954, p. 976-977.

Developments in shaking tables, fine grinding, hydraulic classification, mechanical thickeners and flotation. (B13, B14)

295-B. Steadily Growing Southeastern Tungsten Production. John V. Hamme. *Mining Engineering,* v. 6, Oct. 1954, p. 978-982.

Improvements in processing plant result in increased tungsten ore production. Equipment and operating procedures. Table, flowsheets, photographs. (B general, W)

296-B. Statistical Analysis Points the Way for $$$$ Savings in Beneficiation. A. C. Dorenfeld. *Mining Engineering,* v. 6, Oct. 1954, p. 986-988.

Evaluation when ore changes and analysis of process changes. Graphs, tables. 4 ref. (B14, S12, Zn)

297-B. Adding Lead to Steel—Here's How It's Done. Robert F. Huber. *Steel,* v. 135, Oct. 25, 1954, p. 150-152, 155.

Methods of adding and controlling distribution of lead in any steel. Photographs, table.
(B22, D general, Pb, ST)

298-B. (English.) **On the Magnetic Property of Iron Oxides.** Hiroshi Kojima. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 2, Apr. 1954, p. 178-185.

Magnetic behavior of alpha ferric oxide during reduction and magnetite during oxidation; chemical and X-ray analysis. Tables, graphs, diagram, micrograph. 5 ref.
(B14, P16, Fe)

299-B. (English.) **The Role of the Electric Potential at the Phase Boundary in Flotation.** Onzo Jyo. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 3, June 1954, p. 259-287.

Equations for the theoretical relationship of the zeta-potential and floatability. Zeta-potential data are not sufficient to anticipate change of floatability. Tables, graphs, diagram, 96 ref. (B14)

300-B. (German.) **The Leaching of Sulfide Minerals Under Oxygen Pressure.** G. Björling. *Metall,* v. 8, nos. 19-20, Oct. 1954, p. 781-784.

Advantages and disadvantages of floating sulfide ores of iron, copper, zinc, lead, nickel and cobalt under oxygen pressure and chemical reactions of the sulfides with oxygen. Diagrams, 7 ref.
(B14, Fe, Cu, Zn, Pb, Ni, Co)

301-B. (Russian.) **Problem of the Reaction of Reagents With Zinc Blende.** I. N. Plaksin and G. N. Khazhinskaia. *Doklady Akademii Nauk SSSR,* v. 97, no. 6, Aug. 21, 1954, p. 1045-1046.

Effect of lime on absorption of ethyl xanthogenate by zinc sulfide. Flotation with and without activation by blue vitriol. Effect of iron impurities. 3 ref. (B14, Zn, Fe)

302-B. (Swedish.) **Aspects of Swedish Iron Ore Concentration.** P. G. Kihlstedt. *Jernkontorets Annaler,* v. 138, no. 9, 1954, p. 499-526; disc., p. 526-538.

Practices to determine best system for Swedish conditions. Tables, graphs. 20 ref. (B14, Fe)

303-B. Phase Equilibrium Studies of Steel Plant Refractories Systems. E. F. Osborn. *American Iron and Steel Institute, Preprint,* 1954, 33 p.

Factors influencing behavior of furnace linings. Diagrams, graphs, tables. 19 ref. (B19)

304-B. Increase Yield of Alumina. *Chemical Engineering,* v. 61, Nov. 1954, p. 334-337.

Modification of Bayer process recovers 90% of alumina. Photographs, flow sheets. (B14, Al)

305-B. Use of Beryllium in Light Metals. E. A. Smith, Jr. *Light Metal Age,* v. 12, Oct. 1954, p. 24-27, 37.

Small additions of beryllium make alloys more workable, stronger and harder by improving melt characteristics. Graph, photograph.
(B22, Be, Al, Mg)

306-B. Titanium Ores Flow From Australian Beaches. George Farwell. *Light Metal Age,* v. 12, Oct. 1954, p. 30-31.

Reserves, composition and separation methods of black beach sands. Photograph. (B10, B14, Ti)

307-B. (French.) **Choice of Fuel for Heating of Furnaces.** *Fonderie,* 1954, no. 103, Aug., p. 4099-4101.

Cost factor in selecting fuel for molding ovens, crucible furnaces, enameling and rotary kilns. Table. (B18, E10, E18, L27, ST)

308-B. (German.) **Comparative Investigations of Special Foundry Cokes.** M. T. Mackowsky. *Giesserei,* v. 41, no. 20, Sept. 30, 1954, p. 540-541.

Differences in chemical composition, properties, reactivity and microstructure. Tables, micrographs. 3 ref. (B22)

SECTION C

NONFERROUS EXTRACTION and REFINING

1-C Investigation of Thickening and Metal Entrapment in a Light Alloy Melting Flux. A. H. Sully, H. K. Hardy and T. J. Heal. *Institute of Metals, Journal,* v. 82, Oct. 1953, p. 49-58 + plate VIII.

Principle of fluxing; upon thickening of flux with continued use, agglomeration of most metal entrapped therein may be effected by stirring. Tables, graphs, diagrams. 18 ref. (C21, B21, Al)

2-C. Copper Refining, Rolling and Drawing. *Metal Industry,* v. 83, Oct. 16, 1953, p. 315-318.

Equipment, plant layout and operating procedures. Photographs. (C general, F23, G4, Cu)

3-C. (French.) **Gadolinium Rich Gadolinium-Magnesium Alloys. Production and Magnetic Properties.** Francoise Gaume-Mahn. *Comptes rendus,* v. 237, no. 14, Oct. 5, 1953, p.702-704.

Melting techniques. Magnetic properties were determined at temperatures between 78 and 300° K. 6 ref. (C21, P16, Gd, Mg)

4-C. (French.) **Calculation of the Temperature of Thermal Reactions and the Effect of Preheating.** Jean Venturini. *Metaux, Corrosion-Industries,* v. 28, no. 338, Oct. 1953, p. 396-405.

Detailed calculations for the above; corrects temperatures assumed for aluminothermal reductions. Practical results of such a correction in avoiding excessive volatilization and slag losses. Tables, graphs. (C26, Al)

5-C. (Portuguese.) **Production of Lead Refined to 99.99+ Per Cent at the Institute of Technical Research.** Tharcisio D. de Souza Santos. *ABM (Boletim da associacao brasileira de metais),* v. 9, no. 31, Apr. 1953, p. 235-259.

Details of equipment and procedures. Includes flow chart. 10 ref. (C21, Pb)

6-C. Hurley Furnace and Boiler Description and Design. E. A. Slover. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1435-1441.

Construction details of reverberatory furnace and waste heat boilers designed for more efficient and flexible operation. Diagrams, tables. (C21, Cu)

7-C. Continuous Casting of Brass. Daniel S. Ogden. *Wire and Wire Products,* v. 28, Nov. 1953, p. 1194-1195, 1246.

Equipment and operating procedures. Photographs. (C5, Cu)

8-C. The Properzi Process for Continuous Casting and Rolling of Aluminum Redraw Rod. Frank R. Nichols. *Wire and Wire Products,* v. 28, Nov. 1953, p. 1185-1187, 1229-1230.

Development of the process in Europe and recent improvements in USA. Photographs. (C5, F23, Al)

9-C. (Polish.) **Metallic Calcium Production.** M. Orman. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 3, 1953, p. 129-134.

Methods of production, properties and application. Theoretical analysis of the aluminothermic process. Diagrams, graphs, tables, micrographs. 8 ref. (C26, Al)

10-C. Precipitation of Vanadium From Aqueous Vanadate Solutions by Reduction With Hydrogen. R. N. O'Brien, F. A. Forward, and J. Halpern. *Canadian Mining and Metallurgical Bulletin,* v. 46, no. 499, Nov. 1953, p. 673-676; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 56, 1953, p. 359-362.

Details of process. Effects of catalyst, hydrogen pressure, temperature and solution composition. Graphs, tables. 7 ref. (C2, V)

11-C. Electrical Conductivity and Density of Molten Cryolite With Additives. Junius D. Edwards, Cyril S. Taylor, Lee A. Cosgrove and Allen S. Russell. *Electrochemical Society, Journal,* v. 100, Nov. 1953, p. 508-512.

Experimentally determined electrical conductivities at 1000° C. for cryolite containing 10% by weight NaF, CaF_2, AlF_3 and Al_2O_3. Photograph, graphs, tables. 11 ref. (C23, P15, Al)

12-C. Brand New Plant for Secondary Smelting. William J. Fadden, Jr. *Engineering and Mining Journal,* v. 154, Nov. 1953, p. 72-77.

Equipment, plant layout and operating procedures for smelting aluminum, brass, lead and zinc scrap. Photographs, diagrams. (C21, Al, Zn, Pb, Cu, Zn)

13-C. Ultra-Pure Metals Produced by Zone-Melting Technique. Earle E. Schumacher. *Journal of Metals,* v. 5, Nov. 1953, p. 1428-1429.

New process in which a series of rather narrow molten zones is moved slowly along an ingot of relatively impure material. Each successive zone causes further refining. Diagram, photograph. 3 ref. (C5, Ge)

14-C. Change in Ingot Shape During Zone Melting. W. G. Pfann. *Journal of Metals,* v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, Nov. 1953, p. 1441-1442.

Tapering of ingot as a molten zone traverses it. Prevention of matter transport by inclining ingot at critical angle. Diagrams. 4 ref. (C5, Ge)

15-C. Analysis of Molten-Zone Refining. Norman W. Lord. *Journal of Metals,* v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, Nov. 1953, p. 1531-1533.

Process analyzed for long ingots and many zone passages. Formulas are derived which give resultant impurity distribution in terms of finite series. Tables, diagram, graphs. 2 ref. (C5)

16-C. Gas Combustion Practice Described for Copper Smelters of the Southwest. Harold Foard. *Journal of Metals,* v. 5, Dec. 1953, p. 1629-1630.

Burners, controls and flame characteristics. Photographs. 2 ref. (C21, Cu)

17-C. Electrolytic Production of Manganese. T. Banerjee. *Journal of Scientific & Industrial Research,* v. 12, sec. A, Oct. 1953, p. 457-462.

Equipment and operating procedures, including electrolytes, cells, electrodes and power requirements. Diagram. 34 ref. (C23, Mn)

18-C. Metal Melting Under Vacuum. Some Mechanical Problems Involved. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 259-260.

Furnace construction, temperature measurement and pouring procedures. Graph, diagram, photographs. (C25, D8, E23)

19-C. (Italian.) **A View on Titanium Metallurgy.** P. Spinedi. *Alluminio,* v. 22, no. 5, Oct. 1953, p. 523-537.

Problems of economical mass production of pure titanium. Tables, graphs, diagram. 46 ref. (C general, Ti)

20-C. Why Gas Fuel is Expanding Its Usefulness With Light Metal Alloys. C. George Segeler. *Gas Age,* v. 112, Dec. 17, 1953, p. 34-35, 75-77.

Reports increasing number of applications for gas fuel since technical and competitive problems of gas equipment have been solved. Photographs. (C21, J general, Al, Mg)

21-C. How Natural Gas Helps Make Aluminum, Key Material for Airframes. Arthur Q. Smith. *Gas Age,* v. 112, Dec. 17, 1953, p. 36-37.

Applications of natural gas to aluminum production. (C21, J general, Al)

22-C. Extraction of Thorium and Cerium From Monazite Sands of Travancore. I. R. K. Dutta. *Journal of Scientific & Industrial Research,* v. 12, sec. B, Oct. 1953, p. 485-488.

Laboratory method for preparation of thorium nitrate and cerium ammonium nitrate from Indian monazite. Tables. 6 ref. (C general, Ce, Th)

23-C. Extraction of Thorium & Phosphoric Acid From Monazite Sands of Travancore. II. R. K. Dutta and N. K. Dutta. *Journal of Scientific & Industrial Research,* v. 12, sec. B, Oct. 1953, p. 488-490.

Laboratory method for preparation of thorium nitrate and phosphoric acid from Indian monazite. Tables. 5 ref. (C general, Th)

24-C. Refining Low-Grade Copper. *Metal Industry,* v. 83, Nov. 27, 1953, p. 441-442.

Processes and equipment for recovery from low-grade ores, ash, residues and scrap. Photographs. (C21, A8, Cu)

25-C. (Hungarian.) **Practical Aspects of the Thermodynamics of Magnesium Oxide Reduction.** Andor Szulyovszky. *Aluminium (Budapest),* v. 5, no. 9, Sept. 1953, p. 185-196.

Discusses thermodynamic data of magnesium reduction as basis for work necessary in starting a Hungarian magnesium industry. Tables, graphs. 14 ref.
(C general, P12, Mg)

26-C. The Electrolytic Preparation of Molybdenum From Fused Salts. I. Electrolytic Studies. II. The Preparation of Reduced Molybdenum Halides. III. Studies of Electrode Potentials. Seymour Senderoff and Abner Brenner. *Electrochemical Society, Journal,* v. 101, Jan. 1954, p.16-38.

Photograph, diagrams, tables, micrographs, graphs. 48 ref. (C23)

27-C. Continuous Casting Machine for Copper Ingots. *Engineering,* v. 176, Dec. 25, 1953, p. 809-810.

Construction and operation of a unit capable of delivering ingots at 15 tons per hr. Photographs.
(C5, Cu)

28-C. Making the Best of Metals. *Institute of Metals, Journal,* v. 82, 1953; *Institute of Metals, Bulletin,* v. 2, Dec. 1953, p. 28-53; disc., p. 53-55.

Symposium of Birmingham Local Section of Institute of Metals on Feb. 27, 1953. Includes "Non-Ferrous Metal Resources", R. Lewis Stubbs; "Some Elementary Thermodynamics of Refining", V. Kondic; "The Preparation of Refined Copper and Copper-Base Alloys From Metal Scrap", H. J. Miller; "Remelting and Refining of Aluminium Alloys", E. Scheuer; "The Aluminothermic Process and Its Variants", T. Burchell; "The Recovery of Copper and Zinc From Liquid and Gaseous Effluents", S. Hands; and "The Economical Use of Metals", W. L. Hall and E. C. Mantle. 41 ref. (C general, A8, EG-a)

29-C. Shapes of Floating Liquid Zones Between Solid Rods. P. H. Keck, M. Green and M. L. Polk. *Journal of Applied Physics,* v. 24, Dec. 1953, p. 1479-1481.

Theoretical and experimental determinations for stable zones between germanium and silicon rods during purification. Table, graph, diagrams. 5 ref. (C28, Si, Ge)

30-C. Production of Pure Zirconium. *Metal Industry,* v. 83, Dec. 25, 1953, p. 522-523.

Equipment and techniques employed. Photographs.
(C general, Zr)

31-C. Copper-Base Continuous Castings. *Precision Metal Molding,* v. 12, Jan. 1954, p. 44-45, 48.

New method of casting with advantages and uses of its products. Photographs, table. (C5, Cu)

32-C. Quantitative Study of Extraction of Titanium Dioxide From Ilmenite by Smelting. I. W. Freundlich. Henry Brutcher, Altadena, Cal., Translation no. 3119, 25 p. + 1 plate. (From *Bulletin de la société chimique de France,* v. 19, no. 5, 1952, p. 490-496.)

Previously abstracted from original. See item 135-C, 1952. (C4, Ti)

33-C. (German.) **Observations on the Continuous Casting of Light Metal Billets.** K. E. Mann. *Aluminium,* v. 29, no. 12, Dec. 1953, p. 497-508.

Faults occurring during continuous casting of aluminum and magnesium alloys. Mechanical properties of alloys prepared by continuous casting. Micrographs, photographs, tables.
(C5, Q general, Al, Mg)

34-C. (German.) **Purifying Industrial Zinc Sulfate Solutions by Cementation.** H. Enzfelder. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben,* v. 98, no. 11, Nov. 1953, p. 227-234.

Electrolytic methods were used to extract zinc from the ore. Procedure for precipitating disturbing elements from zinc sulfate solutions. Tables, graphs. 35 ref.
(C27, B14, Zn)

35-C. (German.) **Processing Zinc Dust and Dross in the Directly Heated Revolving-Drum Furnace.** G. Lorber. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 861.

Efficient method of extracting zinc. Photographs, table.
(C21, A8, Zn)

36-C. (German.) **Process of Producing Tin Solder and Antifriction Metals.** H. Kiessler. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 870-872.

Specifications. Tables. 2 ref.
(C general, Sn)

37-C. (German.) **The Residual Zinc in the Distillation of Al-Zn Alloys.** H. Schunck. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 875-876.

Factual data on vapor pressures of zinc at different composition and temperatures. Graphs, tables.
(C22, Zn, Al)

38-C. (Russian.) **Mechanism of Over-Voltage Formation on the Carbon Anode in Cryolite-Alumina Fusions.** S. I. Rempel and L. P. Khodak. *Zhurnal Prikladnoi Khimii,* v. 26, no. 9, Sept. 1953, p. 931-940.

Origin of high-anode voltage during electrolytic refining of aluminum. Diagram, graphs. 16 ref.
(C23, Al)

39-C. How Dowa's Plant Extracts Cu-Zn From a Single Electrolyte. Alpheus W. Jessup. *Engineering and*

Mining Journal, v. 155, Jan. 1954, p. 72-74.

Procedure used in this process. Photographs, diagram. (C23, Cu, Zn)

40-C. Australian Metallurgist Reports on African Smelting Progress. L. A. Lyons. *Engineering and Mining Journal,* v. 155, Jan. 1954, p. 96-100.

Types of ores treated, equipment and processes. Tables, photographs. (C21)

41-C. Nickel Production. A. R. Bailey. *Metal Industry,* v. 84, Jan. 8, 1954, p. 23-24.

Ore composition and smelting processes. Table. 16 ref. (C21, Ni)

42-C. Preparation and Casting of Metals and Alloys Under High Vacuum. J. D. Fast, A. I. Luteijn and E. Overbosch. *Philips Technical Review,* v. 15, Oct. 1953, p. 114-121.

Method whereby metals and alloys of extreme purity and precise composition can be produced in a form that lends itself well to further shaping into test specimens or components. Photomicrographs, photographs, diagram, table, graph. 8 ref. (C25, D8)

43-C. Centrifugal Separation of Liquid and Solid Phases From Some Binary Alloys. A. K. Schellinger and M. J. Spendlove. *U. S. Bureau of Mines, Report of Investigations* 5007, Nov. 1953, 19 p. + 21 plates.

Results for experimental tests on use of centrifugal force for separating liquid and solid phases in molten nonferrous alloys. Tables, diagrams, graphs, photographs, micrographs. (C28, Pb, Bi, Sb, Mg, Sn, Fe)

44-C. Electrochemical and Electrometallurgical Industries of Canada. III. Ontario and Manitoba. A. C. Holm. *Electrochemical Society. Journal,* v. 101, Feb. 1954, p. 41C-49C.

Industries and their nation's major power developments. Photographs. (C23, L17)

45-C. Extractive Metallurgy of Zirconium by the Electrolysis of Fused Salts. II. Process Development of the Electrolytic Production of Zirconium From K_2ZrF_6. M. A. Steinberg, M. E. Sibert and E. Wainer. *Electrochemical Society, Journal,* v. 101, Feb. 1954, p. 63-78.

Intensive investigation of optimum conditions. Photomicrographs, tables, diagrams, graphs, photographs. 7 ref. (C23, Zr)

46-C. Casting Titanium. John Ham and Roger Veneklasen. *Foundry,* v. 82, Feb. 1954, p. 94-95.

A vacuum melting and casting system. Photograph, radiograph, diagram. (C25, Ti)

47-C. The Port Pirie Smelters. *Mining Journal,* v. 242, Jan. 8, 1954, p. 43-45.

Production methods and detailed sequence of lead refining operation. Flow sheet, photographs, tables. (C21, Pb)

48-C. Pacific Northwest Aluminum Boom Continues in '54 for All Producers. *Western Metals,* v. 12, Jan. 1954, p. 51.

Continuing expansion program including new equipment and production records. (C23, Al)

49-C. (French.) **Observations on the Preparation of Leaded Bronze.** *Fonderie,* 1953, Nov., no. 94, p. 3693-3696.

Treatment by various slag-forming agents. Tables, graph. (C21, Pb, Cu, Zn, Sn)

50-C. (Book.) **Control of Quality in the Production of Wrought Non-Ferrous Metals and Alloys. I. Control of Quality in Melting and Casting.** Institute of Metals, 4 Grosvenor Gardens, London. 15 s. ($2.50.)

Melting and casting of nonferrous metals and alloys for production of ingots. Includes papers on underlying principles by Singer; brass ingots by Maurice Cook; copper by J. Sykes; zinc by C. W. Roberts and B. Walters; aluminum by R. T. Staples and H. J. Hurst; and magnesium by R. G. Wilkinson and S. B. Hirst. (C21, C5, Cu, Zn, Al, Mg)

51-C. (Book.) **Extractive Metallurgy in Australia—Non-Ferrous Metallurgy. v. IVB.** Frank A. Green, editor. 272 p. Australasian Institute of Mining and Metallurgy, 399 Little Collins Street, Melbourne, Australia. £A 1 5s, unbound; £A 1 15s bound.

Mainly devoted to extraction of lead and silver, zinc, copper, cadmium, antimony, aluminum, and sulphur. Details of final products and firms who process these metals, and refractories used in the Australian copper and lead smelting and refining industries.

(C general, Pb, Ag, Zn, Cu, Cd, Sb, Al)

52-C. (Book—German.) **(Clay and Aluminum. Results Gained by Practical Experience. 1920 to 1952. 2nd part: Aluminum). Tonerde und Aluminium. Ergebnisse und Erfahrungen aus der Betriebspraxis, 1920-1952. Zweiter Teil: Das Aluminium.** Wilhelm Fulda and Hans Ginsberg. 353 p. 1953. Walter de Gruyter & Co., Berlin W35, Germany. DM44.

A comprehensive survey of all chief processes involved in extraction and refining of aluminum. (C general, Al)

53-C. The Free World's Nickel Refining Troubles. *Mining Journal,* v. 242, Jan. 29, 1954, p. 124-125.

Reviews history of nickel industry. Predicts erection of nickel refining facilities, both on North American Continent and in Cuba, tailored to suit requirements of individual deposits. (C general, Ni)

54-C. (German.) **Preparation and Constitution of Copper-Boron Alloys.** F. Lihl and O. Feischl. *Metall,* v. 8, nos. 1-2, Jan. 1954, p. 11-19.

Various methods of preparing alloys. Thermal analysis, hardness and conductivity measurements, isolation and analysis of the boride as a means of studying structure of the alloys. Micrographs, tables, graphs. 7 ref.
(C general, M23, Q29, P15, Cu, B)

55-C. (German.) **Deoxidizing of Lead.** W. W. Krysko. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 6, no. 11, Nov. 1953, p. 442-445.

Solubility of oxygen in lead. Experiments for development method for eliminating oxygen from lead by means of aluminum additions. Advantages of process. Photographs. 12 ref. (C21, P13, Pb)

56-C. (German.) **Separation of Chemically Pure Vanadium From the Gaseous Phase.** G. Jantsch and F. Zemek. *Monatshefte für Chemie,* v. 84, no. 6, Dec. 15, 1953, p. 1119-1126.

Reduction of vanadium tetrachloride with pure hydrogen. Diagrams, micrographs, spectrograph. 22 ref. (C2, V)

57-C. (German.) **Continuous Process of Lead Refining in the Oker Lead-Copper Smelter.** Jürgen Feiser, Helmut Börger and Georg Krahn. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 1, Jan. 1954, p. 1-3.

Modification of continuous refining at Port Pirie, Australia, to compensate for low production at Oker. Furnace arrangement. Diagrams. 4 ref. (C21, Pb)

58-C. (German.) **Recent Developments in the Field of Sinter Roasting, Their Importance to the Smelting of Lead Ores.** Helmut Wendeborn. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 1, Jan. 1954, p. 3-11; disc., p. 11.

Direct process of extracting lead from lead-rich concentrates; advantages of compressed-air sintering. Diagrams, photographs, tables, graphs. 7 ref. (C21, B16, Pb)

59-C. (German.) **The New Roasting Plant in the Neivenheim Zinc Smelter of the Stolberg Zinc AG.** Reinhard Fischer. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 1, Jan. 1954, p. 11-14.

Plant arrangement. Discusses pelleting apparatus and a multiple-tier roasting furnace. Diagram, photographs. (C21, B15, Zn)

60-C. (German.) **Microscopic Investigations of Segregation Processes in Slag Melting.** Sven Lundqvist. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 1, Jan. 1954, p. 14-17.

Metallographic studies of slags on copper matte melts at usual temperatures reveal that these slags may segregate magnetite due to low rate of magnetite solution in the melt. Photomicrographs. 11 ref.
(C21, B21, M27, Cu)

61-C. (German.) **Smelting of Ilmenite.** Walter Schaller. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 1, Jan. 1954, p. 18-22.

Shows that metallic iron can be extracted by smelting with sodium oxide at temperatures up to 1400° C. Graphs, tables, micrographs. 6 ref. (C21, Ti)

62-C. Reverberatory Furnaces for Melting Aluminum. *Canadian Metals,* v. 17, Feb. 1954, p. 18, 20.

Fast, economical method of melting aluminum with maintained quality. (C21, Al)

63-C. Molybdenum. *Iron Age,* v. 173, Feb. 18, 1954, p. 166-169.

Preparation of high-purity metal by electrolysis has been achieved by the National Bureau of Standards. Photographs. (C23, Mo)

64-C. (German.) **Discontinuous Freezing Processes in Continuous Casting of Raffinal or Pure Aluminum.** Dietrich Altenpohl. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 536-550.

Investigations revealed periodic liquations up to 15 mm. below casting skin formed by reheating of ingot surface. Pure aluminum showed highly variable etchability. Photographs, graphs, micrographs, diagrams, tables. 10 ref. (C5, Al)

65-C. Purifying Zinc by Distillation. *Canadian Chemical Processing,* v. 38, Feb. 1954, p. 34, 36.

Zinc dross and wastes recovered by distilling in special furnaces. Photographs. (C22, A8, Zn)

66-C. Titanium Production Expanding Rapidly. T. W. Lippert. *Industrial Heating,* v. 21, Feb. 1954, p. 272, 274, 280.
(C general, Ti)

67-C. Refining Molybdenum. *Steel,* v. 134, Mar. 1, 1954, p. 146-147.

Electrolytic preparation of this

critical refractory metal has proved successful. (C23, Mo)

68-C. The Production of Antimony. Wayne D. Gould. *Western Miner and Oil Review,* v. 27, Feb. 1954, p. 42-43.

Procedure used in obtaining antimony from a copper-antimony-silver sulfide mineral. (C21, Sb)

69-C. Quantitative Study of Extraction of Titanium Dioxide From Ilmenite by Smelting. II. W. Freundlich. *Henry Brutcher, Altadena, Calif., Translation no.* 3120, 19 p. (From *Bulletin de la Société Chimique de France,* v. 19, no. 5, 1952, p. 496-501.)

Previously abstracted from original. See item 135-C, 1952. (C4, Fe, Ti)

70-C. (French.) **Electrolytic Refining of Aluminum. I. Some Physiochemical Properties of Baths and Their Influence in Electrolysis of Aluminum. II. Secondary Formation of Aluminum. Thermodynamics of Reactions at the Electrodes. III. New Explanation of Anodic Effect by Considering the "Solvation" of Ions in Igneous Electrolysis of Aluminum. Possible Existence of Perfluorides at the Anode. IV. Is There a Relationship Between the Composition of Electrolysis Bases and the Faraday Efficiency? Origin of CO-Variation With Interpolar Distance.** E. Pruvot. *Alluminio,* v. 22, no. 6, Dec. 1953, 31 p.; disc., 7 p.

Includes tables, graphs, diagrams. 4 ref. (C23, Al)

71-C. (French.) **A New Method of Rapid Analysis of Baths Used in Electrolytic Production of Aluminum.** M. Fiquet and M. Armand. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 621-628; disc., p. 628-630.

Suggests use of caustic soda to separate sample into two phases. Data from routine tests. Graphs, diagrams, table. (C23, Al)

72-C. (Italian.) **Classification of Baths by the Electrolysis of Al_2O_3 According to Phase Diagrams and Micrographic Analysis.** A. Vajna. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 635-641; disc., p. 641-643.

Thermal analysis of cryolite base binary and ternary systems carried out with special equipment. Photographs, micrographs, diagrams, graphs. (C23, M24, Al)

73-C. (French.) **Electrolysis of Aluminum Chloride and the Chemicophysical Properties of Electrolytic Baths.** A. von Zeerleder. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 655-660; disc., p. 661-662.

Various systems. Electrothermal reduction of siliceous bauxites in form of silico-aluminum and electrolytic refining. Tables, graphs, photographs, diagrams, map. 19 ref. (C23, Al)

74-C. (French.) **Considerations on the Power Balance of Electrolysis for Production of Aluminum.** R. Piontelli. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 731-745; disc., p. 745-748.

Relation between composition of aluminum pot gases and current efficiency. Diagrams, tables. 11 ref. (C23, Al)

75-C. (German.) **Method of Obtaining Gallium From Commercial Aluminum Alloys.** Ekkehard Gastinger. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben,* v. 99, no. 1, Jan. 1954, p. 13-16.

Problem of separating small quantities of gallium from large quantities of aluminum and iron. Tables, diagram. 14 ref. (C28, Ga, Al)

76-C. (Italian.) **Control of Voltage in Electrolysis of Aluminum.** J. Moravansky. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 663-671.

Methods adopted in several factories, and method used at Ranshofen plant in Austria. Graphs, diagrams, photographs. (C23, Al)

77-C. (Italian.) **Measuring Cathodic Overvoltage in Electrolysis for Producing Aluminum.** R. Piontelli and G. Montanelli. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 672-677; disc., p. 677-678.

Analysis of fused salt-bath method by means of reference electrode. Results. Diagrams, graphs, table. 16 ref. (C23, Al)

78-C. (Italian.) **Observations on the Interpretation of Processes for the Electrolysis of Aluminum.** Kai Grjotheim. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 679-686; disc., p. 686-689.

Electrolytic reduction of alumina in molten cryolite baths. Graph, tables, diagrams. 14 ref. (C23, Al)

79-C. (Italian.) **Reactions Between Carbon Dioxide and Metallic Fog in the Alumina Electrolysis Cells.** R. Schadinger. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 691-697; disc., p. 697.

Current efficiency shown to be between 85 and 90% in industrial conditions. Table, diagrams, graphs. 4 ref. (C23, Al)

80-C. (Italian.) **Current Efficiency in Electrolysis Cells in Relation to Specific Consumption of Coal and Power.** B. Panebianco. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 718-720.

Current efficiency in a Söderberg type self-baking anode industrial cell. (C23, Al)

81-C. (Italian.) **Action of Magnetic Fields in Large Cells for Electrolysis of Aluminum.** R. Jötten. *Alluminio,*

v. 22, no. 6, Dec. 1953, p. 751-758.
Advantages and disadvantages of large electrolytic cells. Diagrams, graphs. (C23, Al)

82-C. (Italian.) **Electromagnetic Forces in Large Cells for Aluminum Production.** J. Wleugel. *Alluminio,* v. 22, no. 6, Dec. 1953, p. 759-765; disc., p. 765-769.
Causes, action on furnace and possible methods of reducing the forces. Diagrams, graphs, photographs. (C23, Al)

83-C. (Italian.) **Present Work in the Field of the Production of Copper.** G. Porro. *Metallurgia italiana,* v. 45, no. 11, Nov. 1953, p. 405-424.
Ore treatment, extractive metallurgy, foundry practice with black and blister copper, refining of black copper and casting. Diagrams, graph. 7 ref. (C general, B general, Cu)

84-C. (Portuguese.) **Specific Weights of Box Furnace Slags by Reduction of Lead Sinters.** Tharcisio D. de Souza Santos and Joao Galha. *ABM (Boletim da associacao brasileira de metais),* v. 9, no. 32, July 1953, p. 424-436.
Determines by pycnometry specific weight of lead slag samples obtained by melting reduction furnace slags in electric furnace. Composition of slags studied was between 20 to 65% silica, 30 to 80% iron oxide and 5 to 40% lime. Graphs, charts. (C21, B21, Pb)

85-C. **Zinc by Distillation.** *Canadian Metals,* v. 17, Mar. 1954, p. 16, 18.
Method of refining zinc, including equipment and techniques. Photographs. (C22, Zn)

86-C. **Metals of the Future.** G. J. Crites. *Instrumentation,* v. 7, no. 2, 1954, p. 14-15.
Vacuum furnaces plus accurate measurement and control of variables make possible production and processing of new metals such as zirconium, titanium, vanadium, cerium and germanium. Photographs, diagrams. (C25, Zr, Ti, V, Ce, Ge)

87-C. **Chemically Pure Metals.** *Instrumentation,* v. 7, no. 2, 1954, p. 34-35, 37.
Metals such as lithium, magnesium and antimony of high purity can be produced by distillation under high vacuum. Amount of pressure employed during distillation has important effect on purity. Photograph, diagrams. (C22, Li, Mg, Sb)

88-C. **Copper Smelting in Boliden's Rönnskär Works Described.** Olov Herneryd, Olof A. Sundstrom and Allan Norro. *Journal of Metals,* v. 6, Mar. 1954, p. 330-337.
Equipment, procedures and economics in single shift operation. Tables, photographs, diagrams. (C21, Cu)

89-C. **Current Refractory Practice as Applied in Copper Smelting.** William F. Rochow and Lincoln A. McGill. *Journal of Metals,* v. 6, Mar. 1954, p. 338-342.
Although refractories are available which permit reasonable or satisfactory smelting costs, extensive research continues in an effort to develop refractories which will be capable of withstanding even more severe treatment. Graph, diagram. 2 ref. (C21, Cu)

90-C. **Copper Converting Practice at American Smelting and Refining Company Plants.** F. W. Archibald. *Journal of Metals,* v. 6, Mar. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Mar. 1954, p. 358-360.
Standardization of copper converting practice to attain a maximum unit blister production with a minimum of refractory consumption by careful location of tuyeres and by applying magnetite coatings on hard-burned magnesite brick linings. (C21, Cu)

91-C. (French.) **Application of Zone Melting Technique to Obtain High-Purity Aluminum.** Frédéric Montariol, Robert Reich, Philippe Albert and Georges Chaudron. *Comptes rendus,* v. 238, no. 7, Feb. 1954, p. 815-817.
Adaptation of method used to refine germanium. Reports attainment of purity of 99.998%. Tables. 3 ref. (C21, Al)

92-C. (German.) **Thermodynamics of Zinc Condensation.** Gotthard Björling. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 2, Feb. 1954, p. 69-73.
Conditions necessary for zinc oxide reduction and condensation of generated zinc vapor in a form adaptable to practice. Graphs. 6 ref. (C22, P12, Zn)

93-C. (Hungarian.) **Complex Utilization of Bauxite.** Adam Juhasz. *Kohaszati Lapok,* v. 9, no. 1, Jan. 1954, p. 10-17.
Reduceability of iron oxide in bauxite, correct composition of the slags, waste gases and behavior of secondary constituents. Tables, graphs. 7 ref. (C21, Al)

94-C. (Hungarian.) **The Problem of Economical Current Density, and the Exploitation of Capacity of Aluminum Plants.** Endre Balazs. *Kohaszati Lapok,* v. 9, no. 1, Jan. 1954, p. 38-42.
Relationship between economical current density and construction of furnaces. Methods for calculating

necessary current densities and interpretation of results. Graphs, tables. 2 ref. (C23, Al)

95-C. Instrumentation. J. F. Hornor and J. V. Metzger. *Metal Industry,* v. 84, Mar. 12, 1954, p. 205-208.

Control instruments and their operation in a continuous casting process of the Properzi type for production of aluminum rod. Photographs, diagrams. (C5, S18, Al)

96-C. Electrodeposition Research at the Bureau of Mines. Oliver C. Ralston. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529, p. 37-39; disc., p. 39-40. 1953.

Extractive metallurgy utilizes electrodeposition of metals as a recovery process. Electrophoretic deposition is used as means of recovering colloidal sizes of solids from aqueous suspensions of washed minerals. 4 ref. (C23)

97-C. Manganese Production by Electrolysis. *Chemical & Process Engineering,* v. 35, Mar. 1954, p. 89-90.

Electrolytic process for obtaining manganese from its ores is likely to prove economical and give a product free from impurities. Electrolytic manganese was successfully used in production of nonferrous manganese alloys and in steel production. Diagram. (C23, Mn)

98-C. Inside Three Atomic Factories. *Chemical Engineering,* v. 61, Apr. 1954, p. 130, 132, 134, 136.

Britain's atomic energy program. Uranium, plutonium production. Photographs. (C general, U, Pu)

99-C. Magnesium Extraction From Fused Salts. A. L. Hock. *Magnesium Review and Abstracts,* v. 9, Dec. 1953, p. 1-30.

Historical background, electrolysis in fluoride baths, electrolytes in molten chloride baths, principles of magnesium electrolysis, cells based on natural and artificial carnallites and on magnesium chloride cell feed, magnesium cells with liquid cathodes and possible trends in future design and operation of molten chloride cells. Diagrams, tables. 27 ref. (C23, Mg)

100-C. Temperature Regulator Used in Producing Germanium Crystals. G. J. Lehmann and C. A. Meuleau. *Electrical Communication,* v. 31, Mar. 1954, p. 19-26.

Construction of high-frequency furnace and an electronic temperature regulator that stabilizes at 930 ± 0.16° C. Photographs, diagrams. 7 ref. (C21, S16, Ge)

101-C. Techniques for the Investigation of Thermal Conditions in Continuous Casting. D. M. Lewis. *Institute of Metals, Journal,* v. 82, Apr. 1954, p. 395-413 + 3 plates.

Apparatus and techniques for aluminum alloys. Photograph, radiograph, graphs, diagrams. 45 ref. (C5, Al)

102-C. The Use of Autoradiography for Finding the Solidification Boundary in Continuously Cast Aluminium. J. L. Putman. *Institute of Metals, Journal,* v. 82, Apr. 1954, p. 414-416 + 1 plate.

Experimental work to determine whether Au^{198} and Cu^{64} are suitable for use as radioactive tracers for delineation of liquid-solid interface in continuously cast aluminum billets. Radiographs. (C5, M23, Al)

103-C. Germanium Diodes From Spherical Pellets. W. C. Dunlap, Jr. *Journal of Applied Physics,* v. 25, Apr. 1954, p. 448-451.

Preparation and properties of germanium spheres prepared by ejection of molten droplets from a graphite crucible under pressure of a gas. Photographs, graph, diagrams. (C5, Ge)

104-C. Ultra-Pure Metal. *Metal Progress,* v. 65, Apr. 1954, p. 196, 198, 200.

New method for purification known as "zone melting" applied to germanium with good results. Impurities critical to semiconductor behavior are reduced as low as 1 to 10^{10}. 3 ref. (C21, Ge)

105-C. Preparation of Isotopic Lithium Metal by Thermochemical Reduction. P. S. Baker, F. R. Duncan and H. B. Greene. *Science,* v. 119, Apr. 9, 1954, p. 469-470.

Lithium chloride is reduced by barium metal. Photograph. Tables. 8 ref. (C26, Li)

106-C. On the Production of Pure Metals of the Titanium Group by Thermal Decomposition of Their Iodides. V. Titanium. J. D. Fast. *Henry Brutcher, Altadena, Calif., Translation no.* 3243, 22 p. (From *Zeitschrift für Anorganische und Allgemeine Chemie,* v. 241, 1939, p. 42-56.)

Production of ductile titanium by thermal decomposition of titanium iodide and deposition on an electrically heated wire. Graph, diagram, tables, photographs. 12 ref. (C4, Ti)

107-C. (French.) **The Effect of the Method of Casting on Distribution of Impurities in Aluminum and on the Appearance After Anodic Oxidation.** H. Richaud. *Revue de métallurgie,* v. 51, no. 1, Jan. 1954, p. 13-16.

Causes and remedies of impurities. Micrographs. 4 ref. (C5, Al)

108-C. (German.) **Copper Refining in Rotating Drums.** *Metallurgie und Giesserei Technik,* v. 4, no. 1, Jan. 1954, p. 31-32.

Efficiency compared with ordinary flame furnace. Diagrams, tables. (C21, Cu)

109-C (Russian.) **Cathodic Deposition of Nickel From Molten Chloride Baths.** S. F. Pal'guev and M. V. Smirnov. *Zhurnal Prikladnoi Khimii,* v. 26, no. 11, Nov. 1953, p. 1166-1175.

Quality of cathodic deposits shown to depend on current intensity. Diagram, tables, micrographs. 4 ref. (C23, Ni)

110-C. Separation of Tantalum and Niobium by Liquid-Liquid Extraction. J. R. Werning, K. B. Higbie, J. T. Grace, B. F. Speece and H. L. Gilbert. *Industrial and Engineering Chemistry,* v. 46, Apr. 1954, p. 644-652.

Batch and continuous countercurrent procedures compared and evaluated. Diagram, photographs, tables, graphs. 13 ref. (C28, Ta, Nb)

111-C. Electrical Nickel Smelting. I. Continuous Electric Smelting of Low Grade Nickel Ores. *Mining Journal,* v. 242, Apr. 9, 1954, p. 415-416.

Structures of ores tested described with preliminary tests and smelting procedures. Table. (C21, Ni)

112-C. (German.) **High-Temperature-Pressure Furnace.** G. Busch, F. Hulliger and U. Winkler. *Helvetica Physica Acta,* v. 27, no. 1, 1954, p. 74-80.

Design of furnace which can be rapidly heated to 5400° F. and operated under vacuum or up to 10 atmospheres. Diagrams, graph. 4 ref. (C21)

113-C. (Italian.) **Continuous Casting and Empirical Calculation of Descent Speed in Casting of Light Alloy Ingots.** G. Porro and P. Lombardi. *Alluminio,* v. 23, no. 1, Jan. 1954, p. 23-34.

Determines optimum casting speed in relation to size of aluminum ingots. Diagrams, graphs, tables. 12 ref. (C5, Al)

114-C. (Italian.) **Electrolysis of Molten Salts.** Marc Van Lanckèr. *Alluminio,* v. 23, no. 1, Jan. 1954, p. 40-45.

Metallic equilibrium and enthalpy relations. Study of aluminum production. 22 ref. (C23, P12, Al)

115-C. (Russian.) **Interaction of Metallic Copper With Copper Mattes.** N. P. Diev, V. V. Paduchev and A. F. Plotnikova. *Zhurnal Prikladnoi Khimii,* v. 27, no. 2, Feb. 1954, p. 127-135.

Results, method of investigation and dissolution mechanism at 1000 and 1200° C. Tables, graphs. 3 ref. (C21, Cu)

116-C. Production of Electrolytic Manganese. N. Dhananjayan, H. K. Chakrabarti and T. Banerjee. *Journal of Scientific & Industrial Research,* v. 13, sec. A, Feb. 1954, p. 136-144.

Electrolysis of solution containing sulfates of manganese and ammonia and sulfur dioxide in canvas diaphragm cell employing stainless steel cathode and lead anodes. Graphs, tables, diagram. 20 ref. (C23, Mn)

117-C. Floating Zone Recrystallization of Silicon. P. H. Keck, W. Van Horn, J. Soled and A. MacDonald. *Review of Scientific Instruments,* v. 25, Apr. 1954, p. 331-335.

Equipment to carry out recrystallization and zone melting, single crystals of resistivities up to several hundred ohm cm. have been grown. Photographs, diagrams. 5 ref. (C general, N5, Si)

118-C. (Hungarian.) **Energy Problem in the Electrolytic Reduction of Alumina.** Arisztid Czeke. *Kohaszati Lapok,* v. 9, no. 3, Mar. 10, 1954, p. 133-144.

Analytic method shows 13 to 15% of power could be saved with better construction and operation of Söderberg electrolytic cell. Diagram, nomograms, graphs, table. (C23, Al)

119-C. Strategic Metal Out of the North. *Canadian Chemical Processing,* v. 38, Apr. 1954, p. 52, 54, 56.

Equipment, plant layout and processing techniques of Canada's Cobalt Chemicals, Ltd., Photographs, flow sheet. (C general, Co)

120-C. Production of Rare Earth Metals in Quantity Allows Testing of Physical Properties. F. H. Spedding and A. H. Daane. *Journal of Metals,* v. 6, May 1954, p. 504-510.

Preparation of kg. quantities of high-purity lanthanum, cerium, praseodymium and neodymium. Unsuccessful attempts to employ method to prepare yttrium, samarium and gadolinium. Apparatus, techniques and problems encountered. Properties of prepared metals. Photograph, diagram, tables, graphs. 17 ref. (C general, P general, EG-g)

121-C. Copper Slabs Weighing 3000 Lb. Successfully Cast at Raritan Works. C. D. Pearce. *Journal of Metals,* v. 6, May 1954, p. 512-514.

Equipment, plant layout and operating procedures. Photographs, tables. (C5, Cu)

122-C. Mechanism and Rate-Controlling Factors in the Dissolution of Gold in Cyanide Solution. V. Kudryk and H. H. Kellogg. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 541-548.

Factors controlling rate of dissolution of pure gold in cyanide solution studied both directly and through measurement of current-potential curves for anodic and cathodic portions of reaction. Diagrams, graphs. 14 ref. (C24, Au)

123-C. (Hungarian.) **Power Requirements of Aluminum Electrolysis.** Arisztid Czeke. *Kohaszati Lapok,* v. 9, no. 4, Apr. 10, 1954, p. 178-183.

Power losses caused by resistance of the electrolyte, voltages occurring during contact of molten aluminum and electrolyte and possibilities for decreasing power requirements. Tables, graphs. 8 ref. (C23, Al)

124-C. (Russian.) **Behavior of Arsenic and Antimony During Electrolytic Refining of Copper.** L. Ia. Livshits and V. A. Pazukhin. *Zhurnal Prikladnoi Khimii,* v. 27, no. 3, Mar. 1954, p. 298-309.

Electrodeposition observed only when current density exceeds 300 amp. per sq. m. Tables, graphs. 18 ref. (C23, Cu)

125-C. Fractional Fusion. C. H. L. Goodman. *Research,* v. 7, May 1954, p. 168-177.

Recent techniques for purification and homogenization of materials by zonal melting. Possible applications. Graphs, diagrams. 6 ref. (C5)

126-C. (Czech.) **Using Sulfur Monochloride S_2Cl_2 for the Manufacture of Light Metal Alloys and for Processing Aluminum Scrap.** Zdenek Eminger. *Slévarenstvi,* v. 2, no. 1, Jan. 1954, p. 11-14.

Elimination of magnesium from the melt. Diagrams. 3 ref. (C21, Al)

127-C. (Russian.) **Electrolytic Preparation of Ternary Alloys of Nickel With Iron and Molybdenum.** T. F. Frantsevich-Zabludovskaia, I. N. Frantsevich and K. D. Modylevskaia. *Zhurnal Prikladnoi Khimii,* v. 27, no. 4, Apr. 1954, p. 413-420.

Influence of concentration of a neutral salt on change of electrolytic composition during electrolysis. Tables, graphs, micrographs 20 ref. (C23, Ni, Fe, Mo)

128-C. The Separation of Rare Earths by Ion Exchange. VII. Quantitative Data for the Elution of Neodymium. VIII. Quantitative Theory of the Mechanism Involved in Elution of Dilute Citrate Solutions. F. H. Spedding and J. E. Powell. *American Chemical Society, Journal,* v. 76, May 5, 1954, p. 2545-2557.

Distribution of neodymium between Nalcite HCR resin and 0.17 citric acid-ammonium citrate eluent from pH of 5 to 8. Elution process is based on thermodynamics, electrical neutrality and material balance. Tables, graphs. 9 ref. (C28, Nd)

129-C. The Operation of the Flin Flon Smelter and Fuming Plant of the Hudson Bay Mining and Smelting Company, Limited. R. E. Mast and G. H. Kent. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 505, May 1954, p. 328-344; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 208-224.

Equipment and operating procedure. Tables, plant layout, flowsheet, photographs, diagrams. (C21, Cu)

130-C. Preparation of High Purity Lead. Ray C. Hughes. *Electrochemical Society, Journal,* v. 101, June 1954, p. 267-270.

Bismuth and other elements are displaced from lead salt in solution by lead metal. Other impurities are coprecipitated on lead sulfide, converted to metal and finally vacuum distilled. 19 ref. (C22, C25, Pb)

131-C. High Purity Silicon. Felix B. Litton and Holger C. Andersen. *Electrochemical Society, Journal,* v. 101, June 1954, p. 287-292.

Thermal decomposition of silicon tetra-iodide investigated in standard iodide (de Boer) and intermittent flow systems for potential use in preparation of high-purity metal. Graphs, photographs, tables. 21 ref. (C4, Si)

132-C. The Problem of Correct Thermal Insulation of Bottom Linings of Aluminum Furnaces. J. Wleugel and O. C. Böckman. *Electrochemical Society, Journal,* v. 101, June 1954, p. 145C-150C.

Theoretical analysis of operating conditions. Considers current density of anode, furnace voltage and distance between anode and metal bath acting as cathode. Graphs, diagram, table. 10 ref. (C23, Al)

133-C. Non-Ferrous Alloy Ingot Manufacture. W. G. Mochrie. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B21-B29; disc., p. B29-B30.

Equipment and practices in production of ingots for foundry use. Table, photographs. (C5, E general)

134-C. Zinc Smelting. *Metal Industry,* v. 84, May 14, 1954, p. 429-432.

Production of zinc, sulfuric acid and sweet roasted concentrates (oxides). Photographs, diagrams, table. (C21, Zn)

135-C. (French.) **The Problem of Ultimate Traces of Impurities in Metals.**

Georges Chaudron. *Bulletin de la société chimique de France,* 1954, no. 4, Apr., p. 419-422.

Application of zone melting method to super-refinement of aluminum. Obtaining pure iron by electrolysis. Tables, graphs. 10 ref. (C5, D8, Fe, Al)

136-C. (Russian.) **Vacuum Dezincing of Lead-Zinc Alloys.** D. M. Chizhikov and M. P. Smirnov. *Zhurnal Prikladnoi Khimii,* v. 27, no. 5, May 1954, p. 514-526.

Advantages of vacuum distillation for accelerating zinc condensation. Tables, graphs, diagrams. 4 ref. (C25, C22, Pb, Zn)

137-C. Some Factors Influencing the Production of Manganese From Open-Hearth Slags. I. The Establishment of Correct Operating Conditions in the Electric Furnace and the Chemistry of the Two-Stage Process. J. A. Gregory. *Australasian Engineer,* 1954, Apr., p. 47-53.

Difficulties encountered during full-scale operation and methods of control. Graphs. 14 ref. (C21, D2, Mn)

138-C. Uranium Tons. Grams of Plutonium. *Chemical and Engineering News,* v. 32, June 7, 1954, p. 2288, 2290, 2292.

Solvent extraction process used to make primary separation of plutonium from uranium. Photograph, diagram. (C28, U, Pu)

139-C. Thorium and Rare Earths From Monazite. A. E. Bearse, G. D. Calkins, J. W. Clegg and R. B. Filbert, Jr. *Chemical Engineering Progress,* v. 50, May 1954, p. 235-239.

Processing sodium hydroxide offers advantages over conventional sulfuric acid process now used by rare earths industry in U. S. Tables, photographs, diagram. 4 ref. (C28, EG-g, Th)

140-C. Plutonium Factory at Sellafield, Cumberland. *Engineer,* v. 197, May 21, 1954, p. 742-744.

Irradiation of uranium and subsequent chemical treatment of the products to separate plutonium, uranium, solvents, and unwanted fisson products. Photographs. (C28, U, Pu)

141-C. A Note on Certain Disproportionation Reactions of the Halides of Titanium. S. Ramamurthy. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 274-278.

Stability of decomposition of tetrahalides examined by evaluating free energy changes at different temperatures. Tables. 3 ref. (C4, Ti)

142-C. Some Developments in the Electrolytic Production of Aluminium. R. Thyagarajan, R. S. Ramachandran and K. K. Cherian. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 296-318 + 1 plate; disc., p. 318-319.

History and growth of industry. Developments in cell design and operation and anode manufacture. Mechanism of reaction between various constituents of bath in electrolytic cell. Tables, graphs. 25 ref. (C23, Al)

143-C. Amalgam Metallurgy: Present Trends and Future Possibilities. J. Balachandra. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 320-325; disc., p. 326.

Present applications of amalgams and some future possibilities in extraction of metals. Tables. 5 ref. (C29, Hg)

144-C. Titanium Metal Production Expanded at Henderson Plant. P. J. Maddex. *Journal of Metals,* v. 6, June 1954, p. 734-736.

Plant equipment and operations. Chlorination and arc-melting furnaces. Photographs, diagram, flow sheet. 2 ref. (C2, C21, Ti)

145-C. Reverberatory Furnace Practice at Noranda. J. N. Anderson. *Journal of Metals,* v. 6, June, 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, June 1954, p. 745-758.

Smelter developments over 25-yr. period including increasing furnace tonnage from 700 to 2000 tons per furnace day, the use of the suspended basic roof and improvements in furnace fuel ratio. Diagrams, tables. 5 ref. (C21, Cu, Au)

146-C. Purification of Antimony and Tin by a New Method of Zone Refining. M. Tanenbaum, A. J. Goss and W. G. Pfann. *Journal of Metals,* v. 6, June 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, June 1954, p. 762-763.

A reciprocating method of passing molten zones through a straight ingot which effects a considerable economy of time and apparatus. Tables, diagrams. (C5, Sb, Sn)

147-C. New Technique for Preparing Homogeneous Alloys. Pascal Levesque. *Journal of Metals,* v. 6, June 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, June 1954, p. 772-773.

Utilization of zone melting principles to provide faster alloy homogenization by permitting the melt to freeze at constant temperaure and by favoring the freezing of a solid phase invariant in chemical composition. Diagram, graphs. (C15)

148-C. Zirconium Production by Fused Salt Electrolysis. *Metal Industry,* v. 84, May 28, 1954, p. 468.

Mechanism of process and its results. 2 ref. (C23, Zr)

149-C. (French.) **Aluminum and Electricity.** *Journal du Four Electrique,* v. 63, no. 2, Mar.-Apr. 1954, p. 37-39.

Electricity requirements for aluminum production. (C23, Al)

150-C. (French.) **Single or Three Phase Furnace?** M. Kaufmann. *Journal du Four Electrique,* v. 63, no. 2, Mar.-Apr. 1954, p. 41-42.

Compares two types. The three-phase furnace is more efficient at power settings of 3000-5000 kw. (C21)

151-C. (Hungarian.) **Research Into the Current Efficiency During Aluminum Electrolysis.** Gyula Szekér. *Kohaszati Lapok,* v. 9, no. 5, May 10, 1954, p. 222-232.

Aluminum losses as a function of composition of the electrolyte and temperature; current efficiency as a function of composition of the electrolyte, distance between the poles, current density and temperature; and connection between current efficiency and composition of the anode gases. Tables, charts, diagrams, photograph. 25 ref. (C23, Al)

152-C. Titanium Melting Progress. *Light Metal Age,* v. 12, June 1954, p. 15, 33, 36.

Arc-melting in water-cooled copper crucible and skull melting. Remelting furnaces. Photograph. (C21, Ti)

153-C. Refining Beryllium. *Metal Industry,* v. 84, June 18, 1954, p. 529.

Application of arc smelting with temperatures reaching 15,000 to 20,000° F. (C21, Be)

154-C. A Laboratory Arc-Melting Furnace. Morris L. Nielsen and I. B. Johns. *Review of Scientific Instruments,* v. 25, June 1954, p. 596-598.

Using a glass resin kettle as enclosure, and an inverted-*J* electrode, a small arc-melting furnace was designed for melting metals under an inert atmosphere. Photograph, diagrams, tables. 7 ref. (C21, Ti)

155-C. Pure Metals. Lawrence P. Lessing. *Scientific American,* v. 191, July 1954, p. 36-40.

Vacuum and zone melting, electromagnetic suspension and iodide process for producing zirconium. Properties of pure metals. Micrograph, photographs, diagram. (C5, C23, C25, C4, Q general, Zr)

156-C. A Survey of the Literature on the Extractive Metallurgy and Electrolytic Refining of Bismuth. P. M. Gruzensky and W. J. Crawford. *U. S. Bureau of Mines, Information Circular* 7681, May 1954, 12 p.

Use of aqueous, nonaqueous and fused electrolytes in electrolytic refining. 52 ref. (C23, Bi)

157-C. Refining Indium by Amalgam Metallurgy. F. A. Hames. Paper presented at Pacific Northwest Metals and Minerals Conference of the A.I.M.E., 1954, Portland, Ore. 4 p.

Includes graph. 3 ref. (C29, In)

158-C. (French.) **New Ferromagnetic Bodies in the Rare Earth Group. The Gadolinium-Magnesium Alloys.** F. Gaume-Mahn. *Bulletin de la société chimique de France,* 1954, no. 5, May, p. 569-575.

Alloys obtained by reaction of magnesium on gadolinium fluoride with distillation of excess magnesium. Magnetic properties. Graphs, diagrams, table. 23 ref. (C22, P16, Gd, Mg)

159-C. (German.) **Thermal Production of Aluminum.** Paul Weiss. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 5, May 1954, p. 189-195; disc., p. 195.

Theoretical basis for carbon reduction of aluminum. Suppression of carbide formation and production and refining of preliminary alloy. Diagrams, graph. 15 ref. (C21, Al)

160-C. (German.) **State of Development of Multicomponent Magnesium-Zirconium and Magnesium-Thorium-Zirconium Alloys.** Franz Sauerwald. *Zeitschrift für Metallkunde,* v. 45, no. 5, May 1954, p. 257-269.

Literature review. Tables, graphs, micrographs. 149 ref. (C general, Mg, Zr, Th)

161-C. Electrodeposition of Bismuth. Kelso B. Morris, Dolores Z. Douglass and Clarence B. Vaughn. *Electrochemical Society, Journal,* v. 101, July 1954, p. 343-347.

Bismuth metal of high purity was electrodeposited from molten mixtures of bismuth trioxide (10% and 25%) and the eutectic mixture of sodium and calcium chlorides. Table. 15 ref. (C23, Bi)

162-C. Recovery of Copper From Scrap. D. S. Tandon and T. Banerjee. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 323-349.

Recovery and refining of scrap copper by smelting and by electrolytic processes. Table, flowsheets, diagrams. 37 ref. (C21, C23, A8, Cu)

163-C. Titanium Extraction by Chloride Process Presents a Variety of Problems. W. R. Opie. *Journal of Metals,* v. 6, July 1954, p. 807-810.

Chlorination of rutile, ilmenite and titaniferous magnetite. Production of titanium concentrates by smelting. Photograph, tables, micrographs, flowsheet. (C4, C21, Ti)

164-C. Direct Current Requirements at Carteret Copper Refinery Supplied by Three Units. Edwin M. Meyer. *Journal of Metals,* v. 6, July 1954, p. 811-813.

Rectifiers and other power supply equipment. Photographs. (C21, Cu)

165-C. Desilverizing of Lead Bullion. T. R. A. Davey. *Journal of Metals,* v. 6, July 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, July 1954, p. 838-848.

Reviews published literature on Ag-Pb-Zn system. Practical desilvering processes using zinc. Graphs, phase diagrams, flowsheets. 35 ref. (C26, Zn, Ag, Pb)

166-C. Progress Report on Titanium. *Steel,* v. 135, July 12, 1954, p. 126.

Developments in production of titanium by electrolysis and by reacting titanium carbide with zinc or magnesium oxide. Photograph. (C23, C26, Ti)

167-C. (Czech.) **Theory of Melting in Lead Blast Furnace.** A. Mayer. *Hutnické Listy,* v. 9, no. 5, 1954, p. 276-279.

Experiments with coke combustion; combustion period formulas derived and applied. Table, graphs, diagram. (C21, Pb)

168-C. (Czech.) **Preparation of Titanium Tetrachloride and Its Reduction Into Titanium Metal.** Jiri Rakosnik. *Hutnické Listy,* v. 9, no. 5, 1954, p. 268-272.

Preparation, refining and reduction with magnesium. Diagrams. 11 ref. (C4, C26, Ti)

169-C. Prospects of Electrolytic Production of Magnesium Metal in South India. V. Aravamuthan. *Central Electrochemical Research Institute, Karaikudi, Bulletin,* v. 1, Jan. 1954, p. 19-22.

Review of electrolytic process. Local circumstances favoring production. Cost factors. 5 ref. (C23, Mg)

170-C. Some Techniques for Melting Reactive Metals. D. H. Polonis, R. G. Butters, and J. Gordon Parr. *Research,* v. 7, July 1954, p. 272-277.

Electric arc melting in a water-cooled copper hearth; melting a suspended rod by induction heating; levitation melting. Diagrams, photographs. 13 ref. (C21)

171-C. Purification of Germanium. George H. Morrison and Donald H. Baird. *Sylvania Technologist,* v. 7, July 1954, p. 70-75.

Chemical and physical methods. Normal-freezing, zone-melting and zone-leveling. Growth of single crystals. Graphs, diagrams, photograph, tables. 13 ref. (C5, N12, Ge)

172-C. (Italian.) **Present Trends in the Field of Lead Production.** Giovanni Rolandi. *Metallurgia italiana,* v. 46, no. 5, May 1954, p. 173-184.

Minerals; mineral mixtures; desulfurization; fusion; and refining. (C21, Pb)

173-C. Melting and Heating by Induction. J. C. Howard. *Metal Industry,* v. 85, July 9, 1954, p. 29-31.

Developments in electric furnace operation and design. Photographs. (C21, Al)

174-C. (French.) **Practical Use of Steel Regenerators in Metallurgical Furnaces.** J. Faure. *Métallurgie et la construction mécanique,* v. 86, no. 6, June 1954, p. 517 + 4 pages.

Special application of waste heat converters. Photographs, diagrams. 8 ref. (C21, D2, ST)

175-C. (French.) **Production and Uses of Germanium, Pure Silicon, Tantalum, Niobium and Zirconium.** Chevigny and Roy. *Métaux, Corrosion-Industries,* v. 29, no. 345, May 1954, p. 181-189.

Application to electronics. Table. 26 ref.
(C general, T1, Ge, Si, Ta, Nb, Zr)

176-C. (German.) **Electrothermal Remelting of Copper Electrodes.** Werner Schwartz. *Zeitschrift für Metallkunde,* v. 45, no. 6, June 1954, p. 322-324.

Construction and characteristics of arc and induction furnaces for melting and refining. Diagrams, tables. 13 ref. (C21, A8, Cu)

177-C. (Hungarian.) **Slag Problems of Silicon-Thermal Magnesium Reduction.** Andor Szulyovszky. *Kohaszati Lapok,* v. 9, no. 7, July 1954, p. 326-331.

Production of magnesium from dolomite by reduction with silicon. Silicate reactions. Tables, phase diagrams, graphs. 5 ref. (C26, Mg)

178-C. Induction Melting of Metals. Normal and High Frequency Equipment Surveyed. *Metallurgia,* v. 50, no. 297, July 1954, p. 25-28.

Latest developments. Photographs. (C21, D6)

179-C. The Extractive Metallurgy of Uranium. R. D. Macdonald. Paper from "Nuclear Engineering. Pt. I.". American Institute of Chemical Engineers, p. 69-74.

Ore concentration, leaching procedures and recovery of uranium from both acid and alkaline solutions. Tables. 14 ref. (C general, B14, U)

180-C. (French.) **Concept of Density of Thermal Losses and Its Importance in the Behavior of Aluminum Baths.** L. Ferrand. *Journal du Four Electrique,* v. 63, no. 3, May-June 1954, p. 71-74.

Equations for calculating heat loss during electrolytic refining of aluminum. Graph. 3 ref. (C23, Al)

181-C. A Bottom-Pour, Arc-Type Furnace for Melting and Casting of Titanium. O. W. Simmons, H. R. McCurdy and R. E. Edelman. *American Foundrymen's Society, Preprint no.* 54-36, 1954, 5 p.

Design and operation. Photographs, diagrams. 7 ref. (C21, Ti)

182-C. The Effect of Nickel and Hydrogen Overvoltage on the Precipitation of Gold. H. A. Hancock and G. Thomas. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 508, Aug. 1954, p. 539-546; disc., p. 546-548; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 337-346.

Tests of gold precipitation in the presence of fouling agents. Diagrams, graphs, tables, photograph. 12 ref. (C23, Au)

183-C. Zirconium Production. G. L. Miller. *Metal Industry,* v. 85, Aug. 6, 1954, p. 103-105.

Recent developments in commercial production, Kroll process for zirconium sponge, reduction process separating hafnium and melting. Photographs, graph, diagram. 4 ref. (C26, C28, Zr)

184-C. Aluminothermal Production of Aluminum-Titanium Alloys. J. Cueilleron and C. Pascaud. *Henry Brutcher, Altadena, Calif., Translation no.* 3018, 5 p. (From *Comptes rendus,* (Paris), v. 223, Oct. 1, 1951, p. 745-747.)

Previously abstracted from original. See item 9-C, 1952. (C26, Al, Ti)

185-C. (French.) **Phenomenon of Isotopic Separation Incited by Passage of Electric Current in the Molten Metal.** Guy Nief and Etienne Roth. *Comptes rendus,* v. 239, no. 2, July 12, 1954, p. 162-164.

A current of 1.5 to 2.5 amp. caused appreciable isotopic separation in 99.9% pure gallium. Graph. 1 ref. (C28, Ga)

186-C. (French.) **Metal Working and Semiproducts.** J. R. Tschudnowsky. *Revue de l'Aluminium,* v. 31, no. 211, June 1954, p. 181-191.

Processes and equipment for continuous casting, melting, hot drawing, rolling, wire drawing, forging, welding and extrusion. Photographs. (C5, E10, F general, K general, Al)

187-C. (German.) **Separation of the Platinum Metals With the Aid of Highly Basic Anion Exchangers.** E. Blasius and U. Wachtel. *Zeitschrift für analytische Chemie,* v. 142, no. 5, 1954, p. 341-356.

Isolation and separation of ruthenium, rhodium, palladium, iridium and platinum. Purification of platinum from iron, copper and nickel. Diagrams, tables. 28 ref. (C28, Ru, Rh, Pd, Ir, Pt)

188-C. Midvale Smelter Practice Modified for Two Shift Operation. Hugo L. Johnson and Casper A. Nelson. *Journal of Metals;* v. 6, Sept. 1954, p. 949-951.

Changes in equipment and practices in lead plant. Photographs, table. 2 ref. (C21, Pb)

189-C. Mathematical Methods for Zone-Melting Processes. Howard Reiss. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1053-1059.

Mathematical analysis of solute redistribution as molten zones pass. Graphs, table. 11 ref. (C5)

190-C. (German.) **The Metallurgical Possibilities of the Induction Furnace in Comparison With Other Types of Furnaces.** Willi Goedecke. *Giesserei,* v. 41, no. 16, Aug. 5, 1954, p. 405-410.

Design and operation so as to benefit from stirring action of electromagnetic forces. Graphs, diagrams, table. (C21, D6)

191-C. Continuous Casting—Progress in America. John S. Smart, Jr. *Australasian Engineer,* 1954, July, p. 57-71.

Reviews different processes. Photographs, diagrams, tables, micrograph. 41 ref. (C5, D9)

192-C. Double Melting Technique Improves Homogeneity and Purity of Zirconium and Titanium Ingots. G. L. Miller. *Iron Age,* v. 174, Sept. 23, 1954, p. 116-119.

Equipment, techniques and advantages of method for production of high-quality ingots. Diagrams, photographs, table. 4 ref. (C21, Ti, Zr)

193-C. (German.) **Purification of Silicon by Gradual Melting Without a Crucible.** S. Müller. *Zeitschrift für Naturforschung,* v. 9b, no. 7, July 1954, p. 504-505.

Zone melting procedure and results. Table. 7 ref. (C5, Si)

194-C. (Japanese.) **Production of High Purity Calcium Metal. V. Observation on the Condensed Mass of Crystalline Metallic Calcium and Factors in the Distillation of Calcium Metal. VI. Refining of Impure Calcium Metal and Calcium Alloy Containing Volatile Metal by the Distillation Under a Reduced Pressure.** Eiichi Fujita and Hiroji Yokomizo. **VII. A Design of Distillation Furnace and Heat Balance for Calcium Distillation Under a Reduced Pressure.** Eiichi Fujita. **VIII. Production of Calcium Metal by Thermal Reduction Method. IX. Vacuum Distillation of Calcium Metal.** Eiichi Fujita and Hiroji Yokomizo. **X. Evaluation of the Thermal Reduction and Vacuum Distillation Refining Process for Calcium Metal Manufacture.** Eiichi Fujita. *Government Chemical Industrial Research Institute, Tokyo, Reports,* v. 49, no. 6, June 1954, p. 209-236.

Includes photographs, diagrams, tables, graphs. 16 ref. (C22, C21, C25, Ca)

195-C. (Russian.) **Peculiarities of Behavior of Zinc During Converting of Copper Mattes.** A. I. Okunev and N. P. Diev. *Doklady Akademii Nauk SSSR,* v. 97, no. 3, July 21, 1954, p. 491-494.

Influence of zinc oxide, zinc sulfide and temperature on equilibrium pressure of zinc vapors. Graphs, table. 7 ref. (C21, Zn, Cu)

196-C. Developments in Copper Smelting. W. H. Dennis. *Mining Magazine,* v. 91, Sept. 1954, p. 142-149.

Reverberatory furnaces, wet charging techniques, flash and electrical smelting, converters and dust and sulfur dioxide recovery. Diagrams, tables. (C21, Cu)

197-C. The Place of Sodium in the New Metals Technology. Marshall Sittig. *Chemical Engineering Progress,* v. 50, Sept. 1954, p. 457-459.

Suggests sodium as reducing agent for metals such as titanium, zirconium, thorium, vanadium, columbium, tantalum, molybdenum and uranium. Descaling and finishing operations. Photograph, diagram, tables. 8 ref. (C4, L10, Na, Ti, Zn, Th, V, Cb, Ta, Mo, U)

198-C. (German.) **Reaction Between Molten Zinc Sulfide and Zinc Oxide.** Ernest Justus Kohlmeyer and Gerhard Goldschmidt. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 9, Sept. 1954, p. 387-389.

Melting experiments with equal molecular mixtures of zinc sulfide and zinc oxide indicate reversible reaction expressed by the equation: $ZnS + 2\ ZnO = 3\ Zn + SO_2$. Diagram, graphs, photomicrographs. 8 ref. (C21, Zn)

199-C. (German.) **Carbon Anodes for Aluminum Electrolysis.** Werner Helling, Robert Lange and Günter Helmrich. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 9, Sept. 1954, p. 389-394.

Relation between current yield and anode-carbon consumption to relative $CO:CO_2$ composition of the anode gas. Raw materials, binders and methods for producing carbon anodes. Tables, photographs, diagrams, graphs. 4 ref. (C23, Al)

200-C. Some Observations on the Kroll Process for Titanium. F. S. Wartman, Don H. Baker, J. R. Nettle and V. E. Homme. *Electrochemical Society, Journal,* v. 101, Oct. 1954, p. 507-513.

Mechanism of reduction process. Causes of zonal variations of hardness in crude sponge are largely due to impurities in the magnesium. Photographs, tables, diagram, graph. 11 ref. (C26, Ti, Mg)

201-C. Extracting Zinc From Concentrates by Chlorination. John S. Sieger and Colin G. Fink. *Engineering and Mining Journal,* v. 155, Oct. 1954, p. 90-93.

Laboratory scale tests at high temperatures (650-750° C.) show that zinc and lead can be separated as volatile chlorides, leaving behind unchlorinated iron and/or manganese. Graphs. (C4, Zn, Pb, Mn)

202-C. Methods for Separating Rare-Earth Elements in Quantity as Developed at Iowa State College. F. H. Spedding and J. E. Powell. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Oct. 1954, p. 1131-1135.

Description and evaluation of three processes involving ion exchange resins. Graphs. 29 ref. (C general, EG-g)

203-C. Electrolytic Preparation of Uranium From a Fluoride Bath. S. K. Kantan, N. Shreenivasan and G. S. Tendolkar. Paper from "Nuclear Engineering". American Institute of Chemical Engineers, p. 63-66.

Molybdenum as the cathode, current density 50 to 400 amp. per sq. dm., and temperature 725 to 900° C. studied. Relative merits of the double fluoride and tetrafluoride discussed. Graphs, tables, diagram. 2 ref. (C23, U)

204-C. Processing of Liquid Bismuth Alloys by Fused Salts. D. W.

Bareis, R. H. Wiswall, Jr., and W. E. Winsche. Paper from "Nuclear Engineering". American Institute of Chemical Engineers, p. 228-237.

Experiments and justification of process used in Brookhaven liquid metal fuel reactor for extraction of fission products and possible applications of salt metal extraction processes to thorium-containing breeder blankets. Graphs, table. 5 ref. (C general, U, Bi)

205-C. Non-Ferrous Metals: Extraction and Refining. B. Fullman, editor. Paper from "Reports on the Progress of Applied Chemistry". Society of Chemical Industry, p. 194-207.

Review of British developments in mineral dressing, hydrometallurgy and smelting. 169 ref. (C general, B general, EG-a)

206-C. Electrochemical and Electrometallurgical Industries. H. D. C. Rapson. Paper from "Reports on the Progress of Applied Chemistry". Society of Chemical Industry, p. 243-266.

Surveys British studies of electrodeposition and metal finishing and studies of electrorefining of indium, zinc, antimony, iron, titanium and aluminum. 251 ref. (C23, L17, In, Zn, Sb, Fe, Ti, Al)

207-C. (German.) **Progressive Induction Melting.** Ernst von Kannen. *Giesserei,* v. 41, no. 18, Sept. 2, 1954, p. 456-459.

Design of line-frequency induction furnaces and comparison with other types of furnaces. Operation, advantages and power consumption. Photographs, diagrams, table. (C21, D6)

208-C. (German.) **On the Conservation of Copper in Aluminum Alloys.** Georg Schichtel. *Metallurgie und Giessereitechnik,* v. 4, no. 8, Aug. 1954, p. 375-376.

Modern German practice of producing cast and wrought aluminum alloys with little or no copper. Tables. (C general, Al, Cu)

209-C. (Polish.) **Trends in the Development of the Production of Aluminum by Electrolysis.** Marek Brafman. *Hutnik,* v. 21, no. 7, July 1954, p. 217-224.

Critical review of electrolysis of chlorides or of mixtures of cryolite and aluminum oxide and apparatus. Diagrams, graphs. 15 ref. (C23, Al)

210-C. (Polish.) **Electrolytic Refinement of Aluminum.** Zofia Maslanka-Orman. *Hutnik,* v. 21, no. 7, July 1954, p. 224-227.

Electrolytes and electrolytic apparatus, use of aircraft scrap, Polish achievements and refinement at temperatures below melting point. Diagrams. 17 ref. (C23, Al)

211-C. (Russian.) **Gas Reference Electrode for Measurement in Cryolite-Alumina Melts.** S. I. Rempel', N. A. Anisheva and L. P. Khodak. *Doklady Akademii Nauk SSSR,* v. 97, no. 5, Aug. 11, 1954, p. 859-862.

Variation of potential of oxygen-carbon electrode during variation in current strength. Diagram, graph. 5 ref. (C23, Al)

212-C. A Cell for the Preparation of Small Quantities of Alkali Metals. Philip S. Baker, G. F. Wells and W. R. Rathkamp. *Journal of Chemical Education,* v. 31, Oct. 1954, p. 515-518.

Development of a miniature cell designed for the preparation of alkali metals from small amounts of their salts. Photographs, table. 13 ref. (C23, EG-e)

213-C. (German.) **On the Reduction of WO_3.** O. Herrmann and H. Pfisterer. *Metall,* v. 8, nos. 19-20, Oct. 1954, p. 759-764.

Effect of ThO_2 and alkali silicate additions on the reducing process. Micrographs, graphs. 6 ref. (C21, W)

SECTION D

FERROUS REDUCTION and REFINING

1-D. Experiments on Flame Radiation in an Empty Open-Hearth Furnace. W. P. Cashmore and M. W. Thring. *Iron and Steel Institute, Journal,* v. 175, Oct. 1953, p. 177-182.

Procedures used to determine factors affecting radiation along flame, including steam quality and quantity and fuel temperature. Tables, graphs. 5 ref. (D2)

2-D. (German.) **Application of Unalloyed Steels Produced by Various Melting Processes.** *VDI-Richtlinien* VDI 12-2028. 1952. 14 p.

Possibilities of substituting special converter steel for openhearth steel. Metallurgical basis, properties of converter steel, effects of finishing processes, fields of application, construction and choice of material. Tables. 29 ref. (D3, D2, CN)

3-D. (Swedish.) **On the Possibility of Removing Copper From Steel and Pig Iron.** Louis Améen and Claes Pfeiffer. *Jernkontorets Annaler,* v. 137, no. 7, 1953, p. 238-251.

Use of lead, silver, and bismuth to remove copper from molten pig iron or steel. Tables, graphs. (D1, Cu, CI, Ag, Pb, Bi, ST)

4-D. A Process for the Recovery of Manganese From Open Hearth Slags. I. Development of a Process. II. Technology of the Two Stage Process. H. W. Hosking and J. A. Gregory. *Australasian Engineer,* 1953, Sept., p. 44-55.

The first stage is carried out under acid conditions and produces a high-phosphorus iron. The second reduction uses phosphorus-free slag from first stage and produces a manganese-rich alloy and a slag virtually free of metallic oxides and phosphorus. Graphs, diagram, table. 14 ref. (D2, Mn)

5-D. The Status of Continuous Casting at Allegheny Ludlum. W. B. Pierce. *Blast Furnace and Steel Plant,* v. 41, Nov. 1953, p. 1301-1306.

Pilot plant and operating techniques. (D9, AY)

6-D. A Differential-Pressure Meter for Open Hearths. B. O. Smith. *Instruments,* v. 26, Nov. 1953, p. 1706-1707.

Meter for measurement of open-hearth furnace pressure can be installed close to the measuring point on the roof, eliminating errors due to buoyancy effects in connecting pipes. Diagrams. 4 ref. (D2)

7-D. New Skinningrove Blast Furnace. H. G. W. Debenham and W. H. Tubbs. *Iron & Steel,* v. 26, Nov. 1953, p. 507-512.

Structural features, instrumentation and auxiliary equipment. Photographs, diagrams. (D1)

8-D. Arc Furnace Production. W. B. Wallis. *Iron & Steel,* v. 26, Nov. 1953, p. 521-523.

Trends in electric furnace production of steel. Design and development of furnaces, production at specific installations and economic aspects. Photographs. (D5, ST)

9-D. Preparation of Metallic Iron of High Purity. George A. Moore. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1443-1449; disc., p. 1449.

Brief review of present available methods of producing high purity iron. New method is presented consisting of extraction of ferric chloride by ether, reduction of ferric chloride to ferrous chloride, purification of chloride and subsequent electrolytic deposition of metallic iron. Lists properties of iron produced by this method. Table, diagrams. 15 ref. (D8, Fe)

10-D. Manganese as an Indicator of Blast Furnace Slag Oxidation and

Desulphurizing Power. Nicholas J. Grant, John W. Dowding and Robert J. Murphy. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1451-1454.

Large number of slag-metal tests which were examined regarding effectiveness of manganese as an indicator. Graphs, tables. 6 ref. (D1, Mn)

11-D. (French.) **Study of the Heterogeneity of Forging Ingots.** P. Cattier, C. Dubois, J. Bleton and P. Bastien. *Institut de Recherches de la Sidérurgie, Publications,* ser. A, no. 50, Sept. 1953, 261 p.

Comparative study on melting and forging of steel ingots with respect to segregation and localization of inclusions and mechanical properties. Tables, graphs, micrographs. 22 ref. (D9, F22, M28, Q general, AY)

12-D. (Polish.) **Reclaiming Melts of High-Speed Steel Waste in an Electric Arc Furnace.** K. Radzwicki. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 3, 1953, p. 113-118.

Reclaiming melting entirely without oxidizing and with partial oxidizing. Advantages of adding high speed steel cinder to the charge. Tables. 7 ref. (D5, TS, Cr, W, V, Ti)

13-D. (Polish.) **Slag and Admixture Removal in Basic Open-Hearth Process. III. Sulfur.** E. Bucko. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 3, 1953, p. 143-158.

Slag basicity as the principal factor affecting the ratio of distribution of sulfur between slag and the metal. Graphs, tables. 19 ref. (D2, Fe)

14-D. (Polish.) **Slag and Admixture Removal in Basic Open-Hearth Process. Supplement to Part I. Slag.** E. Bucko. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 3, 1953, p. 159-161.

Relationship between FeO, MgO and Al_2O_3 content in slag and between the values characterizing the slag and its basicity. Graphs. (D2, Fe, Mg)

15-D. Development of Open-Hearth Roof Refractories in Great Britain. James Mackenzie. *American Ceramic Society, Bulletin,* v. 32, Nov. 1953, p. 377-384.

Effect of flux content and density of silica brick on performance in furnaces. Silicrete and similar raw materials. Photographs, micrographs, tables. (D2, Fe)

16-D. Review of European Operating and Technical Practices. III. William C. Bell. *Industrial Heating,* v. 20, Nov. 1953, p. 2211-2212, 2214, 2216, 2218, 2220, 2222, 2224.

European steelmaking processes concludes this series of articles. Tables. (D general)

17-D. Steel Mill Refractories and Masonry. II. *Industrial Heating,* v. 20, Nov. 1953, p. 2283, 2284, 2286, 2288.

Methods of openhearth slag and flue dust removal and advantages of monolithic refractories in furnace spouts. (D2)

18-D. Ironmaking From High-Sinter Burdens. G. D. Elliot, J. A. Bond and T. E. Mitchell. *Iron and Steel Institute, Journal,* v. 175, Nov. 1953, p. 241-247.

Recent work using burdens approaching 100% of sinter in the blast furnace. Results obtained discussed in relation to heat balances. Comparisons are made with ore practice. Chart, tables. 9 ref. (D1, Fe)

19-D. The Mechanism of Reduction of Iron Oxides. J. O. Edström. *Iron and Steel Institute, Journal,* v. 175, Nov. 1953, p. 289-303.

Reduction of pure natural hematite and magnetite crystals by hydrogen and carbon monoxide studied with the aid of the microscope. Graphs, diagram, micrographs. 68 ref. (D general, Fe)

20-D. The Ironmaking Plant at John Summers and Sons (Shotton Works). J. F. R. Jones and A. Walker. *Iron and Steel Institute, Journal,* v. 175, Nov. 1953, p. 313-321.

Equipment, plant layout and operating procedures. Diagrams. (D general, Fe)

21-D. Melting Metals Under Vacuum. *Canadian Metals,* v. 16, Dec. 1953, p. 16, 18, 20.

Induction furnace and facilities for pouring molten steel inside a vacuum container. Photographs, diagram, graph. (D8, TS)

22-D. Steel-Making Processes. James Mitchell. *Engineer,* v. 196, Nov. 20, 1953, p. 655-658.

Trends in methods of producing steel. States case for multiplication of units such as blast furnaces and steel furnaces rather than for an increase in unit size. Stresses that basic bessemer process should be given more serious consideration as an alternative to the basic openhearth. Pre-refining and duplexing methods for intermediate phosphorous irons critically discussed. Tables. (D general, ST)

23-D. Solidification of Steel. III. Casting Defects. T. B. King. *Iron & Steel,* v. 26, Dec. 1953, p. 562-568.

Cracking, hot tearing, shrinkage, porosity, metal penetration and sand burn-on of ingots and castings. 65 ref. (D9, E25, CI)

24-D. Symposium on Open Hearth Availability. *Iron and Steel Engineer,* v. 30, Nov. 1953, p. 55-59, 61-70; disc., p. 59-61, 65-66, 70.

Includes "Fuel and Its Usage", Edward E. Callinan; "Furnace Rebuilding", W. H. Shure; and "Furnace Design and Brickwork", H. C. Paxson. (D2, ST)

25-D. Expansion at the Steel Company of Wales. T. J. Ess. *Iron and Steel Engineer,* v. 30, Nov. 1953, p. 105-120.

Facilities, including coke plant, blast and openhearth furnaces, slabbing and hot strip mills and strip finishing equipment. Photographs, diagrams, tables.
(D general, F23, ST)

26-D. Large Electric Furnace of the Future May Be Six-Electrode Unit. Frank W. Brooke. *Iron and Steel Engineer,* v. 30, Nov. 1953, p. 123-124, 127, 129.

Furnace and its advantages. Photographs, diagrams. (D5, ST)

27-D. Can the Electric Furnace Compete With the Open Hearth? C. F. Ramseyer. *Journal of Metals,* v. 5, Dec. 1953, p. 1617-1621.

Operating costs and future possibilities. Graphs, photographs, tables. (D5, D2, ST)

28-D. Some Observations of Slag-Metal Relations in the Acid Open Hearth Steel Furnace. G. R. Fitterer. *Journal of Metals,* v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1634-1640.

Trends in slag composition in acid openhearth practice, particularly variation in iron and manganese oxides during refining. Explains partially, through slag phase diagram considerations, a procedure which is currently being used to control refining reactions. Graphs, table, heat logs. 16 ref. (D2, ST)

29-D. Solid Phase Identification in Partially Reduced Iron Ore. Gust Bitsianes and T. L. Joseph. *Journal of Metals,* v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1641-1647.

Technique developed for identifying solid phases in partially reduced iron ore. Reduction of dense iron ore was found to take place at distinct interfaces between well-defined layers of participating solid phases. Diagrams, tables, graphs, micrographs. 24 ref. (D1, M27, Fe)

30-D. Exchange of Iron Between Liquid Metal and Iron Silicate Slag. G. Derge and C. E. Birchenall. *Journal of Metals,* v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1648-1650.

Using radioactive Fe^{55} as tracer, it was determined that equilibrium exchange of iron between silica-saturated iron silicate slag and liquid iron in a silica crucible follows first-order kinetics with a rate constant of 0.006 at 1600° C. Graphs. 6 ref. (D general, S19, Fe)

31-D. Steelmaking. I. Co-Operative Research in Steelmaking. A. H. Leckie. **II. Design and Operation of Open-Hearth Furnaces.** R. Mayorcas and A. H. Leckie. **III. Bessemer and Electric Steelmaking.** D. J. O. Brandt and W. H. Glaisher. **IV. Research on Process Chemistry.** C. E. A. Shanahan. **V. Ingots and Ingot Moulds.** W. H. Glaisher. *Metal Treatment and Drop Forging,* v. 20, Nov. 1953, p. 505-524.

Developments in research conducted by the BISRA. Photographs, diagrams, micrographs. 35 ref.
(D general, A9, ST)

32-D. Review of Russian Practice Reveals Rail Steel Production Methods. Carl A. Zapffe. *Journal of Metals,* v. 5, Dec. 1953, p. 1627-1628.

Russian work on flaking of steel forgings. Theory and effect of hydrogen. Table. (D general, F22, ST)

33-D. Scrap Preparation. Key to Quality and Economic Control. E. W. Hunziker. *Steel,* v. 133, Dec. 7, 1953, p. 145, 148, 150, 153.

Types of scrap for steelmaking and effect of scrap preparation on openhearth production. Graphs, photographs, table. (D2, B22, ST)

34-D. (French.) **Lines in Steels With a High Chrome Content.** M. Soubes. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* 1953, no. 11, p. 1763-1769.

Lines can be reduced by elaboration and basic casting in high-frequency furnace. In the arc furnace the substitution of magnesia reduces inclusions. Micrographs, graphs, table. (D6, ST)

35-D. (French.) **The Study of Conditions for a Good Distribution of Materials in the Blast Furnace.** Jean Vibrac. *Métallurgie et la construction mecanique,* v. 85, no. 11, Nov. 1953, p. 851, 853-854, 857, 859, 861.

Detailed discussion of loading apparatus, influence of method of loading on permeability; height of an optimum load; influence of the height of the level of loads; passage of gases at the throat; and diameter of the distribution bell. Graphs, diagrams. (To be continued.) (D1)

36-D. (German.) **Blast-Furnace Operation With Oxygen.** E. Diepschlag. *Chemische Technik,* v. 5, no. 10, Oct. 1953, p. 591-592.

Review of problem and investigations. Complexity of process and resulting ambiguity of conclusions concerning usefulness of application of oxygen. (D1)

37-D. (German.) **New Advances in Production of Pig-Iron in the Electric Low-Shaft Furnace.** Hermann Walde. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1441-1446.

Development of electric smelting. Compares low and high-shaft blast furnaces. Compositions of burden, pig iron and slag. Tables, diagram, photographs. 5 ref. (D1, CI)

38-D. (German.) **Improving Quality of Basic Converter Steel at the Iron and Steel Works at Domnarvet.** Bo Kalling. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1446-1452.

Desulfurization of pig iron, cost calculations, pre-refining and variables affecting quality. Effect of phosphorus, nitrogen and low carbon contents. Photographs, tables, diagrams, graphs. 19 ref. (D3, ST, CI)

39-D. (German.) **Lining of Pig Iron Mixers.** Christian Bruchhausen. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1453-1457.

Comparison of mixers. Life of the lining, mechanical wear at mouth and discharge openings and insulation. Jointless masonry and grinding of magnesite bricks. Table, graphs, photographs. (D1)

40-D. (German.) **Lining of an 800-Ton Pig Iron Mixer With Dolomite Bricks.** Karl Mayer, Fritz Gareis, Sigismund Kienow, Helmut Knüppel and Gerhard Trömel. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1457-1462.

Trials with Halden dolomite bricks to decrease mixing and labor costs. Resistance to slag and mechanical attack. Table, photographs, micrographs. (D1)

41-D. (German.) **Lining an 800-Ton Pig Iron Mixer With Chemically Bound Magnesite Bricks.** Karl Mayer and Helmut Knüppel. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1463-1468.

Laying chemically bound bricks without mortar. Wear and formation of "cat's heads". Life of lining was better than with burned magnesite bricks. Photographs, graph, diagrams. 5 ref. (D1, CI)

42-D. (German.) **German Switchgear Construction in Iron and Steel Works.** Botho Fleck. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1480-1484.

Cut-off capacities of low voltage automatic circuit breakers and fuses. Differences in arrangement and operation between open and closed plants. Photographs, diagram, graphs. (D general)

43-D. (Russian.) **The State of Alumina in Melted Slags.** O. A. Esin and B. I. Lepinskikh. *Doklady Akademii Nauk SSSR,* v. 91, no. 5; Aug. 11, 1953, p. 1187-1190.

Explains a series of congruent-melting compounds including 5 CaO · $3Al_2O_3$, 2 CaO · Al_2O_3 · SiO_2, and CaO · Al_2O_3 · $2SiO_2$ in addition to CaO · Al_2O_3. Graphs. 5 ref. (D general, B21, Fe, Al)

44-D. **Low-Shaft Furnaces.** Georg Bulle. *Blast Furnace and Steel Plant,* v. 41, Dec. 1953, p. 1429-1433.

Studies undertaken on European continent regarding use of low-shaft blast furnaces to smelt pig iron. Advantages and limitations. Diagrams. (D1, Fe)

45-D. **Recuperators for Blast Furnaces.** W. Trinks. *Blast Furnace and Steel Plant,* v. 41, Dec. 1953, p. 1437-1438.

Early attempts to install recuperators in connection with blast furnaces. Present impracticality. (D1)

46-D. **Construction and Operation of Carbon Lining in Gary's No. 10 Blast Furnace.** J. M. Walsh, Jr. *Blast Furnace and Steel Plant,* v. 41, Dec. 1953, p. 1439-1450.

Changes in furnace design, lining construction, curing the carbon, blowing-in and operation of furnace. Photographs, diagrams, tables, graphs. (D1)

47-D. **Heat for Open Hearths.** M. F. Hall. *Instrumentation,* v. 7, no. 1, 1953, p. 8 0.

Instruments indicate, record, integrate and automatically control flows of liquid and gaseous fuels. Photographs. (D2, S18)

48-D. **Significance of Air Temperature in Open-Hearth Operation.** John S. Marsh. *Instruments,* v. 26, Dec. 1953, p. 1876-1878, 1908, 1910.

A velocity thermocouple proves to be an accurate and sensitive tool for diagnosing openhearth furnace behavior. Its use shows that air temperature has large influence on heat time. Graphs, diagrams. 3 ref. (D2, S16)

49-D. **Allegheny Ludlum.** T. J. Ess. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 87-102.

Equipment, plant layout and operating procedures of two steel mills. Photographs, tables, diagrams. (D general, F general, ST)

50-D. Advanced Practices in Italy. Alberto Oreffice. *Metal Progress,* v. 65, Jan. 1954, p. 84-88, 136.

Description of equipment and methods employed by Fabbrica Italiana Automobili Torino, which manufactures Fiat motor cars. Includes electric iron smelting, electric steel production, control and research laboratory procedures and malleable foundry practice. Diagrams, photographs, table. (D5, E10, S12, ST, CI)

51-D. Evolution of the Thomas (Basic Bessemer) Steelmaking Process in Europe. G. Husson. *Metal Progress,* v. 65, Jan. 1954, p. 94-96, 168, 170, 172, 174, 176.

Improvements in controlling the basic bessemer blow, determination of end point and control of sulfur, phosphorus and nitrogen. Benefits achieved with oxygen-enriched blast. Photograph. 10 ref. (D3, CN)

52-D. New Manufacturing Processes for High-Grade Steel in Sweden. Bo Kalling. *Metal Progress,* v. 65, Jan. 1954, p. 108-111, 200, 202.

Review of trends in pig iron and steel tonnages. New developments in production of pig iron, sponge iron and steelmaking. Photographs, graphs. (D general, Fe, ST)

53-D. Refractories for the Basic Open Hearth Furnace. A. McKendrick. *Refractories Journal,* v. 29, Nov. 1953, p. 455-464.

Performance of various types of refractories. Tables. (D2, ST)

54-D. (French.) **Conditions for Favorable Distribution of Materials in the Blast Furnace.** Jean Vibrac. II. *Métallurgie et la construction mécanique,* v. 85, no. 10, Oct. 1953, p. 773, 775-777.

Problems of grain size necessitating sifting of the charges. Effect of grain size upon the contact between solids and gases, permeability coefficient, passage of the charge and losses. Graph. (To be continued.) (D1)

55-D. (Hungarian.) **Physicochemical Processes of Oxygen During Introduction Into the Openhearth Furnace.** O. J. Jacunszkaja and M. N. Sztarovics. *Kohaszati Lapok,* v. 8, no. 8, Aug. 1953, p. 168-176.

Modifications of openhearth process when gaseous oxygen is added. Increase in rate of reduction of the bath by direct oxidation, effect of various factors upon rate of oxidation of carbon and other elements, extent of metal oxidation and significance of exothermal reactions. Tables, graphs. 19 ref. (D2, ST)

56-D. (Swedish.) **Melting Lathe Chips by the Crofts Method.** *Gjuteriet,* v. 43, no. 9, Sept. 1953, p. 168-169.

Special feeding and mixing device for heating the chips to melting point in a nonoxidizing zone. Photographs, diagrams. (D8)

57-D. Basic Hearth Construction and Maintenance. G. Reginald Bashforth. *British Steelmaker,* v. 19, Dec. 1953, p. 704-711.

Causes of hearth failure, taphole construction, shape of hearth and fettling practices. Graph, photograph. 4 ref. (D2)

58-D. Production of Carbon Steel in Large Basic Electric Furnaces. R. J. Tremblay. *Industrial Heating,* v. 20, Dec. 1953, p. 2425-2426, 2428, 2430, 2432.

Manufacture of ingots by single slag method in furnaces charged with 100% scrap. (D5, CN)

59-D. Starches and Starch Products as Depressants in Amine Flotation of Iron Ore. C. S. Chang, S. R. B. Cooke and R. O. Huch. *Mining Engineering,* v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 196, Dec. 1953, p. 1282-1286.

Includes graphs, tables, photograph. 7 ref. (B14)

60-D. (Russian.) **Kinetics of the Low-Temperature Reduction of Iron Ores. Reduction of Artificial and Natural Iron Ores by Hydrogen.** S. T. Rostovtsev and A. P. Em. *Doklady Akademii Nauk SSSR,* v. 93, no. 2, Nov. 11, 1953, p. 329-332.

For the investigation rich Krivoi Rog ore was used. No essential difference was noted in the reduction kinetics between Krivoi Rog ore and chemically pure iron oxide. Graphs. 1 ref. (D1, Fe)

61-D. Pneumo-Hydraulic Control of Blast Furnace Blowers. *Engineering,* v. 176, Dec. 11, 1953, p. 761-762.

Resistance to passage of hot air supply and its regulation. Photograph, diagram. (D1)

62-D. Emissivity and Flame Length. M. W. Thring. *Iron & Steel,* v. 26, Dec. 11, 1953, p. 581-585; disc., p. 655-658.

Abridged from Iron and Steel Institute paper. Effect on heat transfer in openhearth furnace. Diagrams, graphs. (D2)

63-D. Belt-Charged Blast Furnaces of S. A. John Cockerill, Belgium. G. Hookham. *Iron and Steel Institute, Journal,* v. 175, Dec. 1953, p. 409-419.

Briefly reviews reasons for adopting belt system and installation. Shows how new problems in design and practical operation were solved. Diagrams, photographs. (D1)

64-D. The Refractories Association of Great Britain: The Historical Development of Refractory Materials Used in the Basic Open Hearth Furnace. H. R. Lahr. *Refractories Journal,* v. 29, Dec. 1953, p. 505-512.

Presented at a meeting of the Refractories Association of Great Britain, Middlesborough, Nov. 1953. (D2)

65-D. British Ceramic Society: Symposium on Casting Pit Refractories. *Refractories Journal,* v. 29, Dec. 1953, p. 513-517.

Summaries of papers presented at the Autumn Meeting of the Refractory Materials Section, Nov. 1953, London. Includes "A Statistical Investigation Into Factors Affecting the Life of Ladle Linings", N. H. Bacon and J. E. Andrew; "Steel Ladle Trials on Fireclay Bricks", H. R. Lahr; "Laboratory Tests for the Assessment of Ladle Bricks", J. Mackenzie; "Performance of Continental Ladle and Runner Bricks", G. van Gijn; and "Note on the Relationship Between Bulk Density and Thermal Conductivity in Refractory Insulating Bricks", K. W. Cowling, A. Elliott and W. T. Hale. (D9)

66-D. Pozzolanic Cements From Blast Furnace Slag. R. C. Lied, J. H. Handwerk and T. N. McVay. *Rock Products,* v. 56, Dec. 1953, p. 130, 136.

Includes tables. (D1, A8)

67-D. Conditions Favor Six-Electrode Furnace. *Steel,* v. 134, Jan. 11, 1954, p. 77-78.

Reports trend toward elliptical units having 6-point distribution of B.t.u. into metal bath. Photograph. (D5)

68-D. Plant, Operation, and Economics of Oxygen (Converter) Steelworks. K. Rösner. Henry Brutcher, Altadena, Cal., Translation no. 3006, 16 p. + 1 plate. (Condensed from *Stahl und Eisen,* v. 72, no. 17, 1952, p. 997-1004.)

Previously abstracted from original. See item 360-D, 1952. (D3, ST)

69-D. Stringers in Stainless Steel. O. Krifka. Henry Brutcher, Altadena, Cal., Translation no. 3059, 12 p. + 1 plate. (From *Stahl und Eisen,* v. 72, no. 1, 1952, p. 39-42.)

Practical study of best ways of minimizing harmful nonmetallic inclusions (macro and micro-slags) in stainless steel, specifically 18% chromium steel. Micrographs. 10 ref. (D9, SS)

70-D. Loss of Alloying Elements of Steel During Oxygen Refining in the Basic Arc Furnace. I. E. Pachaly. Henry Brutcher, Altadena, Cal., Translation no. 3146, 14 p. + 1 plate. (From *Stahl und Eisen,* v. 73, no. 8, Apr. 8, 1953, p. 461-469.)

Previously abstracted from original. See item 253-D, 1953. (D5, Ni, W, V, Mo, Cu, Co)

71-D. Loss of Alloying Elements of Steel During Oxygen Refining in the Basic Arc Furnace. II. E. Pachaly. Henry Brutcher, Altadena, Cal., Translation no. 3147, 19 p. + 1 plate. (From *Stahl und Eisen,* v. 73, no. 8, 1953, p. 465-469.)

Successful remelting of chromium-manganese stainless scrap with use of oxygen in the basic arc furnace. Data on manganese recovery. Graphs, tables. 9 ref. (D5, SS)

72-D. (Polish.) **Combustion Areas in Front of the Blast Furnace Tuyeres.** Wladyslaw Kuczewski and Kazimierz Moszoro. *Hutnik,* v. 20, no. 12, Dec. 1953, p. 361-367.

Theoretical and practical importance of the Czyzewski pattern for the blast furnace process. Influence of temperature and pressure on velocity of coke consumption. Tables, diagrams, graphs. 8 ref. (D1)

73-D. Regenerator Efficiency and Air Preheat in the Open Hearth. B. M. Larsen. *American Iron and Steel Institute, Preprint,* Oct. 21, 1953, 50 p.

Paper presented at Birmingham Regional Technical Meeting of AISI, Oct. 21, 1953. Data based on tests for regenerator efficiency made on three operating openhearth furnaces which represent about the extremes of present operating practices. Diagrams, tables, graphs. (D2)

74-D. Practical Aspects of Structure and Segregation in Killed Steel Ingot Solidification. Edward A. Loria and Richard L. Keller. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 45-51.

Internal soundness and segregation of electric furnace killed steel ingots have been illustrated in terms of grade, ingot size, and cooling rate. Photographs, table. 19 ref. (D9, CN)

75-D. Relining and Enlarging No. 9 Blast Furnace at Appleby-Frodingham. G. D. Elliot, A. Bridge, E. Jarvis and T. E. Mitchell. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 52-56.

Daily account of relining and enlarging of a blast furnace. (D1)

76-D. Blast Furnace Flue Dust Thickeners. J. D. Walker and E. N. Hower. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 57-61.

Method of reducing total suspended solids in overflow. Drawings, table, photographs. (D1)

77-D. Report on West Coast Steel Plants, 1953. Thomas A. Dickinson. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 62-66, 69.

Includes photographs.
(D general)

78-D. Compressed Air. An Answer to Heavy-Duty Arc Furnace Switching. J. E. Schrameck and J. K. Walker. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 67-69.

Heavy-duty circuit breakers. Photographs, diagrams. (D5)

79-D. Design and Manufacture of Ingot Molds. John H. Shank. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 70-72.

Design of molds at the Colorado Fuel and Iron Corp. and experiences in arriving at a design to fulfill over-all requirements of the several end products. Diagrams. (D9)

80-D. Electrical Developments in 1953. W. E. Miller. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 73-82.

Developments in steelmaking; blooming and slabbing mills; hot strip mills; rod and skelp mills; tandem cold strip molds; and single stand cold reduction mills. Graphs, photographs, diagrams.
(D general, F23, ST)

81-D. Value of Blast Heat in Blast Furnace Operation. Charles E. Agnew. *Blast Furnace and Steel Plant,* v. 42, Jan. 1954, p. 90.

Economic and operating advantages of using hot blast. Table. (D1)

82-D. The Firing of Open Hearth Furnaces. G. Reginald Bashforth. *British Steelmaker,* v. 20, Jan. 1954, p. 18-21.

Important considerations determining choice of appropriate fuel. Comparative data on American and German fuel policy and practice. Diagram, graphs. 17 ref. (D2)

83-D. Blast Furnace Blower Control. *British Steelmaker,* v. 20, Jan. 1954, p. 24-25, 27-28.

Grid-controlled mercury arc rectifier used in conjunction with standard pneumatic regulators to control speed of electrically driven blast furnace blowers, providing reliable and flexible method of regulating automatically volume of air supplied to two furnaces. Photographs, graphs, diagrams. (D1)

84-D. Smoke, Dust, Fumes Closely Controlled in Electric Furnaces. R. S. Coulter. *Iron Age,* v. 173, Jan. 14, 1954, p. 107-110.

Better working conditions, improved community relations, lower maintenance costs have resulted from use of improved smoke control equipment on electric furnaces operated by Bethlehem Pacific Coast Steel Corp. at Los Angeles. From 12,000 to 20,000 lb. of dust are collected daily. Photographs, graphs, diagram, oscillograph, table. (D5)

85-D. Newer Types of Metallic Recuperators. H. Weineck. *Iron & Steel,* v. 27, Jan. 1954, p. 23-25.

Recent installations. Photographs. 10 ref. (D2)

86-D. Iron Ores. C. Rekar. *Iron & Steel,* v. 27, Jan. 1954, p. 31-32. (Abridged from *Stahl und Eisen,* v. 73, Aug. 13, 1953, p. 1094-1101.)

Previously abstracted from original. See item 353-D, 1953.
(D general, B22, Fe)

87-D. Reaction Equilibria Between Metal and Slag in Acid and Basic Open-Hearth Steelmaking. E. T. Turkdogan and J. Pearson. *Iron and Steel Institute, Journal,* v. 176, Jan. 1954, p. 59-63.

Study of extent of equilibrium between metal and slag with respect to reactions involving manganese, phosphorus, ferrous oxide and carbon. Graphs. 17 ref. (D2, ST)

88-D. Steelworks Waste-Heat Boiler Practice. R. McDonald. *Iron and Steel Institute, Journal,* v. 176, Jan. 1954, p. 71-88.

Historical background, design and layout of plants and operational conditions. Investigations into further extraction of heat after waste gases leave boiler. Operational details derived from an economizer recently installed to operate in series with waste-heat boiler. Diagrams, graphs, oscillographs, photograph. 7 ref. (D general)

89-D. Elliptical Electric Furnace Outperforms Conventional Circular Type. James K. Preston. *Journal of Metals,* v. 6, Jan. 1954, p. 18-20.

Reports higher melting rate and lower power input. Table, graph, photograph. (D5)

90-D. Induction Stirring Provides Better Control of Operating Techniques. Harry F. Walther. *Journal of Metals,* v. 6, Jan. 1954, p. 21-23.

Installation and maintenance of equipment and production of stirred steel. Discusses hearth erosion. Photograph. (D6, ST)

91-D. 17 Years of Stirring History Shows International Exchange of Ideas. Eric G. Malmlow. *Journal of Metals,* v. 6, Jan. 1954, p. 24.

Abstract of paper presented at the AIME Electric Furnace Steel Conference, Cincinnati, Dec. 1953.

History of developments in technique of induction stirring. 6 ref. (D6)

92-D. Closed Electric Reduction Furnaces Permit Utilization of Furnace Gas. M. O. Sem. *Journal of Metals,* v. 6, Jan. 1954, p. 30-32.

Techniques with various types of furnaces. Tables, photographs. (D8)

93-D. Optimum Composition of Blast Furnace Slag as Deduced From Liquidus Data for the Quaternary System $CaO-MgO-Al_2O_3-SiO_2$. E. F. Osborn, R. C. DeVries, K. H. Gee and H. M. Kraner. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Jan. 1954, p. 33-45.

Results of experimental studies. Phase diagrams, tables, photograph. 19 ref. (D1, B21)

94-D. Radioactive Tracers for Tagging Special Steel Melts. David L. Douglas. *Nucleonics,* v. 12, Jan. 1954, p. 16-18.

Radioisotopes offer several advantages over customary chemical analysis. Time involved is negligible, little plant space is necessary and melt identification is definite. Tables. 4 ref. (D general, S19, ST)

95-D. Progress in Steelmaking Costs Favor Electrics in Cold Metal Shops. L. F. Reinartz and H. C. Barnes. *Steel,* v. 134, Jan. 25, 1954, p. 96, 98-99.

From paper presented at the Philadelphia Regional Technical Meeting of the American Iron and Steel Institute. Reports that in contrast with low-fuel efficiency and cheap fuel in the openhearth, the electric furnace is characterized by high efficiency and expensive energy. Tables, photograph. (D5, CN)

96-D. Steel's Newest Frontier. *Utilization,* v. 8, Jan. 1954, p. 20-24.

Tremendous expansion of industry exemplified by one plant. Photographs. (D general)

97-D. (French.) **Attempts to Improve the Duration of Converter Bottoms and Linings.** M. Calaque. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* 1953, no. 12, p. 1915-1922.

Results of tests with baking tar held at 110° C. for 24 hr. Describes tests with dolomites. Tables, graphs. (D3)

98-D. (French.) **Control of the Slag in Basic Open-Hearth Furnaces.** M. Bernard. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* 1953, no. 12, p. 1923-1934.

Four methods for determining chemical composition. Diagrams, photographs. (D2)

99-D. (French.) **Contribution to the Study of Dolomite Refractories for Thomas Converters.** Paul Metz. *Revue universelle des mines,* v. 9, ser. 9, no. 12, Dec. 1953, p. 809-831.

Studies were made of wear of the linings and bottoms of basic bessemer converters. Photographs, tables, graphs, diagrams. 18 ref. (D3)

100-D. (French.) **Bottoms of Thomas Converters. Laboratory Study.** R. Gregoire and A. Decker. *Revue universelle des mines,* v. 9, ser. 9, no. 12, Dec. 1953, p. 831-834.

Experiments were conducted to determine action of carbon in presence of slag in bessemer process. Photographs, diagram, table. (D3)

101-D. (German.) **Comparison of American and German Basic Open-Hearth Furnaces.** Arno Ristow. *Stahl und Eisen,* v. 73, no. 24, Nov. 19, 1953, p. 1574-1582; disc., p. 1582-1583.

Includes percentage of total steel production, number and capacity of furnaces, annual capacity of steel mill, type of heating, quality of steel, and furnace linings. Tables, graphs, diagrams. 15 ref. (D2, ST)

102-D. (German.) **The Burner Designs of Maerz Furnaces.** Wilhelm Schmitt. *Stahl und Eisen,* v. 73, no. 25, Dec. 3, 1953, p. 1640-1643; disc., p. 1643-1644.

Details of flow conditions in 13 openhearth furnaces. Results indicate importance of draft conditions and air and gas feed. Tables, diagrams. 8 ref. (D2)

103-D. (German.) **Experiences With Ingot-Mold Lacquers.** Georg Kowarsch. *Stahl und Eisen,* v. 73, no. 25, Dec. 3, 1953, p. 1654-1656; disc., p. 1656-1657.

Properties of "Randite" and "Helios" lacquers. Tables, diagram. 4 ref. (D9)

104-D. (German.) **Coreless Induction-Furnace Plant of 12-Ton Capacity in the Steel Mill Kilsta (Sweden).** Tage Hahn. *Stahl und Eisen,* v. 73, no. 25, Dec. 3, 1953, p. 1658-1659.

Design and operation. Photograph. (D6, ST)

105-D. (German.) **Avoiding Furnace Sows in Blast-Furnace Operation.** Hermann Hold and Bernhard Weilandt. *Stahl und Eisen,* v. 73, no. 26, Dec. 17, 1953, p. 1727-1728.

Recommends cooling the outside of the refractory brick with water. (D1)

106-D. (German.) **On the Improvement of Basic Bessemer Steel.** Hans Kosmider. *Stahl und Eisen,* v. 73, no. 26, Dec. 17, 1953, p. 1729.

Attempts to reduce nitrogen, phosphorus, and sulfur content of steel with oxygen-enriched blast. (D3, CN)

107-D. Large High-Frequency Furnaces. *Foundry Trade Journal,* v. 96, Jan. 21, 1954, p. 73-74.

New 12-ton steel melting units. Photographs. (D6, ST)

108-D. Refractory Types and Applications. H. A. Robertson. *Iron and Steel Engineer,* v. 31, Jan. 1954, p. 86-89.

Selection of right refractories for varied steel plant applications requires good engineering judgment. (D general, F general, J general)

109-D. Electric Furnace vs. Open Hearth in Cold Metal Shops. L. F. Reinartz and H. C. Barnes. *Iron and Steel Engineer,* v. 31, Jan. 1954, p. 114-119.

From paper presented at Philadelphia Regional Technical Meeting of AISI, Dec. 3, 1953. Fuel, material handling, steel quality and economic considerations. Tables. (D5, D2)

110-D. Progress in Steelmaking. Better Distribution With High Speed Tops. *Steel,* v. 134, Feb. 1, 1954, p. 96, 99.

Reports increased blast furnace efficiency by adapting small bell hoppers for fast rotation during filling. Photographs, table. (D1, CI)

111-D. (French.) **Induction Mixing in the Electric Arc Furnace Bath.** *Journal du Four Electrique,* v. 62, no. 6, Nov.-Dec. 1953, p. 165-168.

Advantages for steel producing furnaces. Diagrams, photograph. (To be continued.) (D5, ST)

112-D. The Depression of Liquid Surfaces by Gas Jets. R. D. Collins and H. Lubanska. *British Journal of Applied Physics,* v. 5, Jan. 1954, p. 22-26.

Action of air jets on water is used to explain rapidity of reactions in side-blown converters. (D3, CN)

113-D. Oxygen Shortens Open Hearth Meltdowns. O. D. Eyre. *Steel,* v. 134, Feb. 8, 1954, p. 116, 119.

Taken from a paper presented at the Fall Meeting, Southern Ohio Section, National Open Hearth Committee, AIME. Use of auxiliary corner burners resulted in greater tonnages and better Btu. economy. Diagrams. (D2, ST)

114-D. Progress in the Development of Blast Furnace Refractories. J. Mackenzie. Paper from "Ceramics. A Symposium". The British Ceramic Society, p. 651-670 + 4 plates.

Physical and chemical changes in various types of furnaces. Diagrams, drawing, tables, photographs. 12 ref. (D1, B19)

115-D. (Czech.) **Using Oxygen for Carbon Steel Melts.** Zdenek Eminger. *Hutnické Listy,* v. 9, no. 1, Jan. 1954, p. 18-24.

Analysis of carbon oxidation by use of gaseous oxygen in electric-arc and high-frequency furnaces. Tables, graphs, photographs, diagrams. 3 ref. (D5, D6, B22, CN)

116-D. (French.) **Explosion of Cowper Chimneys.** Dardenne. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* 1954, no. 1, p. 127-131; disc., p. 131-132.

Circumstances and probable causes. Drawings, table. (D1)

117-D. (French.) **Dolomite Linings in a Basic Bessemer Steel Plant.** Recht. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* 1954, no. 1, p. 153-162.

Experiments using dolomite and tar in linings to improve operation of furnaces. (D3, ST)

118-D. (German.) **Improving Service Life of Basic Converter Linings.** Paul Metz. *Stahl und Eisen,* v. 74, no. 1, Jan. 1, 1954, p. 10-24.

Experimental results show that service life was increased by maximum residual carbon in form of graphite, maximum percentage of coarse grains in the dolomite, denseness of refractory materials, vibrating during lining process and firing with oil burners. Graphs, diagrams, photographs, tables. 23 ref. (D3, B19, CN)

119-D. (German.) **Status and Development of the Electrode Controls on Electric-Arc Steel-Melting Furnaces.** Albert Driller. *Stahl und Eisen, v.* 74, no. 2, Jan. 14, 1954, p. 82-95.

Various furnace-electrode feed controls. Diagrams, graphs, photographs. (D5)

120-D. Electric Furnace vs. Open Hearth Furnace in Cold Metal Shops. L. F. Reinartz and H. C. Barnes. *American Iron and Steel Institute, Preprint,* Dec. 3, 1953, 19 p.

Fuel, materials handling, steel quality and economic considerations. Tables. (D5, D2, A4, ST)

121-D. The Preparation of High-Purity Iron Ingots. G. W. P. Rengstorff and H. B. Goodwin. *American Iron and Steel Institute, Preprint,* Dec. 3, 1953, 7 p.

Procedure and results of chemical analysis. Tables. 6 ref. (D9, Fe)

122-D. Lone Star Steel Company Gives the South Another Source of Steel. Charles Longenecker. *Blast*

Furnace and Steel Plant, v. 42, Feb. 1954, p. 198-224.

Complete new manufacturing source is described. Photographs, tables, diagrams. (D general, ST)

123-D. Measuring the Dust Content of Blast-Furnace Gas. *Engineering,* v. 177, Jan. 29, 1954, p. 146.

Continuously recording photoelectric meter. (D1)

124-D. Some Factors Affecting the Wear of Graphite Electrodes in the Electric-Arc Furnace. *Iron and Steel Institute, Journal,* v. 176, Feb. 1954, p. 159-165 + 2 plates.

Abnormally rapid wear of graphite electrode collars is usually associated with a high electrical resistivity, which is probably due to incomplete graphitization of material. Simple nondestructive resistivity tests for complete electrodes are described. Graphs, photographs, diagrams, tables. 4 ref. (D5)

125-D. Sources of Inclusions From Pouring Refractories Investigated. M. P. Fedock. *Journal of Metals,* v. 6, Feb. 1954, p. 125-127.

Ladle brick, sleeves, nozzles and fire-clay mortar are considered as sources of inclusions. Tables, diagram. 3 ref. (D9, B19)

126-D. Regenerator Efficiency and Air Preheat in the Open Hearth. B. M. Larsen. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 129-144.

Based on three commercial furnace tests and electrical analogue calculations. Graphs, tables, diagrams. 11 ref. (D2)

127-D. Progress in Steelmaking. Integrated Electrical System; Heart of the Modern Blast Furnace. C. P. Hamilton. *Steel,* v. 134, Feb. 22, 1954, p. 113, 116, 119.

From paper presented at the Fall Meeting, AISE, Pittsburgh. Typical installation. Photographs, diagrams. (D1)

128-D. Modern Steel-Making. *Times Review of Industry (Supplement),* 1954, p. 30, 32-35.

Economy of steel production in Britain. Photographs.
(D general, A4)

129-D. (Russian.) **Calculation of the Speed of Solidification of an Ingot, Taking Into Account the Temperature Dependence of the Thermophysical Parameters of the Metal.** B. I. Liubov. *Doklady Akademii Nauk SSSR,* v. 92, no. 4, Oct. 1, 1954, p. 763-766.

Method which makes it possible to take into account temperature dependence of heat conductivity and content. 4 ref. (D9)

130-D. Vermiculite in the Steel Industry. A. G. Thomson. *British Steelworker,* v. 20, Feb. 1954, p. 64-65.

Properties and applications. Use for bricks as an antipiping composition and for insulating ingots in transit. Photographs. (D9, B19)

131-D. Regenerator Efficiency and Air Preheat in the Open Hearth. II. B. M. Larsen. *Industrial Heating,* v. 21, Feb. 1954, p. 298, 300, 302, 304, 306, 397.

Factors affecting temperature of the air stream. Diagrams, graph. (To be continued.) (D2)

132-D. Temperature Distribution in the Hearths of Blast Furnaces. V. Paschkis and Taghi Mirsepassi. *Iron and Steel Engineer,* v. 31, Feb. 1954, p. 53-59; disc., p. 59-66.

Computations made to locate 2100° F. isotherm in furnaces with ceramic and carbon linings. Diagrams, graphs, photograph. (D1)

133-D. Characteristics of Slags Obtained in the Production of Ferromanganophosphorus in the Blast Furnace. A. L. Zagianskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3042, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 83, no. 2, 1952, p. 265-267.)

Previously abstracted from original. See item 265-D, 1952.
(D1, B21, Fe-n, ST)

134-D. Continuous Casting of Gray Iron. A. N. Myasoedov and I. R. Dudnik. *Henry Brutcher, Altadena, Calif., Translation no.* 3096, 12 p. (From *Liteinoe Proizvodstvo,* v. 3, no. 11, 1952, p. 2-5.)

Report on quality of gray-iron bars obtained from a plant operated in the Soviet Union. Diagrams, photographs, micrographs, tables. (D9, CI)

135-D. Elimination of Hydrogen From Molten Steel by Flushing With Gas. R. Hamrin and F. de Kazinczy. *Henry Brutcher, Altadena, Calif., Translation no.* 3200, 24 p. (From *Jernkontorets Annaler,* v. 137, no. 7, 1953, p. 224-237.)

Nonequilibrium between hydrogen content of steel and partial pressure of hydrogen in bubbles. Theoretical treatment and comparison with experimental data. Graphs, table. 20 ref. (D general, ST)

136-D. Experiences in Salamander Tapping. C. M. Squarcy and E. H. Bare. *Blast Furnace and Steel Plant,* v. 42, Mar. 1954, p. 331-335.

Economy of time and money with incorporation of improved techniques. Photographs, diagrams, graph. (D9)

137-D. Flame Lengths. J. A. Leys. *Iron & Steel,* v. 27, Mar. 1954, p. 93-94.

Simple equations for calculating length of flames of fuel oil and coke oven gas in openhearth furnace. Case of combined flames of two fuels and equation for flame length given in general form. Graph. 5 ref. (D2)

138-D. Distribution of Manganese Between Slag and Metal Under Reducing Conditions. J. E. Stukel and J. Cocubinsky. *Journal of Metals,* v. 6, Mar. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Mar. 1954, p. 353-356.

Investigation of equilibrium distribution of manganese between blast furnace type slags and iron saturated with carbon. Diagram, graphs, table. 5 ref. (D1, Mn, Fe)

139-D. Magnetite Pelletizing and the Production of Sponge Iron. *Mining Magazine,* v. 90, Feb. 1954, p. 75-78.

Brief account of ore dressing at Bodäs mines and sponge iron production at Sandviken, Sweden. Photographs, diagram. (D8, B16, Fe)

140-D. On the Possibility of Removing Copper From Steel and Pig Iron. L. Améen and C. Pfeiffer. *Henry Brutcher, Altadena, Calif., Translation no.* 3206, 26 p. (From *Jernkontorets Annaler,* v. 137, no. 7, 1953, p. 238-251.)

Previously abstracted from original. See item 3-D, 1954.
(D1, Cu, CI, Ag, Pb, Bi, ST)

141-D. (Czech) **Automatic Open-Hearth Furnace Control Depending on Roof Temperature Measurement.** Miloslav Gottwald. *Hutnické Listy,* v. 9, no. 2, Feb. 1954, p. 90-94.

Description and operation. Diagrams, photographs, charts.
(D2, S16)

142-D. (French.) **Australian Iron and Steel Industry.** C. More. *Métallurgie et la construction mécanique,* v. 86, no. 1, Jan. 1954, p. 7-9.

Facilities and raw material sources. Photographs.
(D general, B10, CI, ST)

143-D. (French.) **Contribution to the Study of the Conditions of a Good Distribution of Materials in the Blast Furnace. III. Charging Equipment.** Jean Vibrac. *Métallurgie et la construction mécanique,* v. 86, no. 1, Jan. 1954, p. 11, 13, 15, 16, 19.

Radial distribution, influence of height of materials in the stack and various bell operations. Diagrams, graphs. (D1, Fe)

144-D. (French.) **A New Aspect of Italian Iron and Steel Production. Heating of Open-Hearth Furnaces With Methane-Fuel Oil.** G. Danielou. *Métallurgie et la construction mécanique,* v. 86, no. 1, Jan. 1954, p. 41, 43, 45.

Principles of burner transformation and results. Photographs, diagrams. (D2)

145-D. (French.) **The Study of Conditions for a Good Distribution of Materials in the Blast Furnace. IV. Method of Charging. V. Radial Distribution and Balanced Charging.** Jean Vibrac. *Métallurgie et la construction mécanique,* v. 86, no. 2, Feb. 1954, p. 92, 95, 97.

Various aspects of charging. (D1)

146-D. (German.) **Low-Shaft Blast Furnaces.** E. Cotel. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 3-4, 1953, p. 413-423.

Present trends in construction. Probable evolution of small furnaces due to use of coke from low-grade coal. Diagrams. 21 ref. (D1)

147-D. (Hungarian.) **Rate of Heating Up Openhearth Furnaces.** Béla Selmeczi. *Kohaszati Lapok,* v. 9, no. 1, Jan. 1954, p. 1-9.

Reviews existing data on type of refractory materials, extent of improvements on the furnace and technology of its construction. Some Hungarian methods. Graphs, diagram. 11 ref. (D2)

148-D. Cost Comparisons of the Open Hearth and Electric Furnace. David D. Moore. *Iron and Steel Engineer,* v. 31, Mar. 1954, p. 55-65; disc., p. 65-69.

Detailed studies on future of steelmaking. Tables, graphs.
(D2, D5, A4, ST)

149-D. Modern Arc Furnace Equipment and Practices. E. H. Browning. *Iron and Steel Engineer,* v. 31, Mar. 1954, p. 70-74; disc., p. 75.

Trends in use of electrical equipment, costs, effect of higher secondary voltages, transformers, circuit breakers and regulators. Graphs, photographs. (D5)

150-D. Bricklaying as a Factor in the Performance of Blast Furnace Linings. W. S. Debenham. *Iron and Steel Engineer,* v. 31, Mar. 1954, p. 76-79; disc., p. 79.

Brick quality and shapes, alignment of lining, packing between stacking and shell, bosh and stack cooler arches and bricklaying. Table, diagrams, chart. (D1)

151-D. Continuous Casting of Iron Bar. *Machinery (London),* v. 84, Mar. 5, 1954, p. 506-507, 516.

Process using metal dies was developed which enables sound bars, free from sand inclusions and blowholes, to be obtained. Photographs. (D9, CI)

152-D. General Blast Furnace Session. *American Institute of Mining and Metallurgical Engineers, Proceedings,* v. 12, 1953, p. 104-157.

Includes "Further Studies of the Tuyere Zone of the Blast Furnace", J. B. Wagstaff; "Experimental Smelting of Char-Ore Agglomerates in a Low-Shaft Blast Furnace", Herbert Kay and Everett Gorin; "Use of Brazilian Ore in the Blast Furnace", James R. Lowe; and "Physically Hot Iron for the Open Hearth", D. M. Morrison. (D1, D2, Fe)

153-D. Blast Furnace Blowing-In Practice. *American Institute of Mining and Metallurgical Engineers, Proceedings,* v. 12, 1953, p. 216-245.

Includes "Preheating and Blowing-In Practice at the Blast Furnace", R. J. Wilson; "Method of Blowing-In Blast Furnace From Bank", Walter W. Durfee; "Blowing-In Practice at American Steel and Wire Division, Duluth Works", W. A. Abbett, Jr.; and "Blast Furnace Blowing-In and Drying-Out Practices, Bethlehem Plants", H. M. Kraner. (D1)

154-D. Blast Furnace Operation. *American Institute of Mining and Metallurgical Engineers, Proceedings,* v. 12, 1953, p. 246-325.

Includes "Some British Aspects of High-Top-Pressure Operation", R. P. Towndrow and W. Banks; "Distribution of Materials in a Blast Furnace Model", R. L. Stephenson and F. C. Langenberg; "Optimum Composition of Blast Furnace Slag as Deduced From Liquidus Data for the Quaternary System CaO-MgO-Al_2O_3-SiO_2", E. F. Osborn, R. C. DeVries, K. H. Gee and H. M. Kraner; and "Instrumentation for Blast Furnace Research", D. I. Sinizer, J. DePiccolellis and E. R. Poor. (D1)

155-D. (French.) **Induction Stirring in the Electric Arc Furnace Bath.** *Journal du Four Electrique,* v. 63, no. 1, Jan.-Feb. 1954, p. 13-17.

Advantages for steel-producing furnaces. Installations in Sweden and the Timken inductive stirrers in Canton, Ohio. Compares results. Tables, photographs, diagrams. (To be continued.) (D5, ST)

156-D. (German.) **Contribution to Deoxidation Control in Steel.** Walter Koch and Franz Wever. *Stahl und Eisen,* v. 74, no. 5, Feb. 25, 1954, p. 264-271 + 4 plates.

Shows that oxide inclusions cannot be completely avoided. Their nature may be influenced in steel works by simple measures. Graphs, micrographs, photographs, diagram. 6 ref. (D general, ST)

157-D. (German.) **Experiences With Gas Generators With Steam Jackets for Openhearth Furnaces.** Heinz Wübbenhorst. *Stahl und Eisen,* v. 74, no. 5, Feb. 25, 1954, p. 272-279.

Experiments and results. Tables, diagrams, graphs. 8 ref. (D2)

158-D. The Basic Open Hearth Process. I. Some Theoretical Considerations. G. Reginald Bashforth. *British Steelmaker,* v. 20, Mar. 1954, p. 88-93.

Chemical reactions involved in deoxygenizing process and problems of sulfur removal. Graphs. 15 ref. (D2)

159-D. Measuring Dust in Blast Furnace Gas. *British Steelmaker,* v. 20, Mar. 1954, p. 114.

Equipment enables alarm to be sounded if a predetermined dust level is exceeded. Provides continuous record of dust concentration and its variations. Photographs. (D1, A5)

160-D. Electric Furnace Cuts Costs. R. O. Loomis. *Electrical World,* v. 141, Apr. 5, 1954, p. 152.

Greater availability for charging; speed in making steel; refractory material costs only one-third that of openhearth; higher quality steel. Photograph, diagram. (D5, ST)

161-D. Oxygen Performs Dual Function in Direct Reduction Process. *Steel,* v. 134, Apr. 5, 1954, p. 120.

Method devised for Venezuela producers of iron ore is applicable to fine ores in this country, especially where a supply of coke oven gas is available. Diagram. (D8)

162-D. (Polish.) **Corrosion of Magnesite Refractories in Openhearth Furnaces.** Franciszek Nadachowski. *Hutnik,* v. 21, no. 1, 1954, p. 6-12.

Corrosion mechanism and effect of iron, oxygen and silicon. Table, micrograph, graphs. 8 ref. (D2, Fe)

163-D. (Book.) **American Institute of Mining and Metallurgical Engineers, Proceedings,** v. 12, 1953. 335 p. American Institute of Mining and Metallurgical Engineers, Inc., 29 W. 39th St., New York 18, N. Y. $10.00.

Proceedings of Conference of the Blast Furnace, Coke Oven, and Raw Materials Committee, held in Buffalo, N. Y., Apr. 1953. Agglomera-

tion and beneficiation of iron ores; coal carbonization; blast furnace operation and blowing-in practice.

Sections are separately abstracted. (D1, B general, Fe)

164-D. (Book.) **Comparative Economics of Open-Hearth and Electric Furnaces for Production of Low-Carbon Steel.** 77 p. 1953. Bituminous Coal Research, Inc., 2609 First National Bank Bldg., Pittsburgh 22, Pa. $10.00.

Briefly reviews steelmaking practice. Compares present performance and costs of furnaces, and forecasts future trends. (D2, D5, A4, CN)

165-D. The Use of Oxygen in the Iron and Steel Industry in Western Europe. I. Georg Bulle. *Blast Furnace and Steel Plant,* v. 42, Apr. 1954, p. 419-423, 427.

Blast furnace practice, operation of openhearth furnace and steelmaking in electric furnaces, all using oxygen. (D1, D2, D5, ST)

166-D. A New Type of Automatic Blast Furnace Charging Control. Edward H. Abbe. *Blast Furnace and Steel Plant,* v. 42, Apr. 1954, p. 424-427.

Need for faster and more accurate charging of blast furnaces has become more pronounced. Nearly 3000 tons per 24-hr. period are loaded into the furnace by automatic control system. Photographs, diagram. (D1)

167-D. Manganese Recovery in the Basic Open Hearth Process. Norman F. Dufty. *Blast Furnace and Steel Plant,* v. 42, Apr. 1954, p. 428-430.

Data on lime-silica ratio of slag for optimum manganese recovery with assumption there was no danger of phosphorus reversion. Table, graphs. 7 ref. (D2, Mn, ST)

168-D. Development of Steelworks Instruments. D. W. Gillings. *Blast Furnace and Steel Plant,* v. 42, Apr. 1954, p. 434-442.

Present day and future lines of development in use of instrumentation. Graphs, photographs, diagrams. 17 ref. (D general, S18, Fe, ST)

169-D. Properties and Applications of Iron Blast Furnace Slag. J. R. Wallace, P. Fedora and N. D. Weiner. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 503, Mar. 1954, p. 160-169; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 92-101.

Historical background, types of slag, composition and properties. Uses include railway ballast concrete, highway and airport construction and fertilizer. Tables, graphs, photographs, diagrams. 9 ref. (D1, B21, T general, Fe)

170-D. Rare Earth Additions Affect Surface Quality of Low Carbon Steel. J. V. Russell. *Journal of Metals,* v. 6, Apr. 1954, p. 438-442.

Effectively reduces sulfur content of steel and improves surface quality, apparently by increase of manganese-sulfur ratios. Graphs, photographs, table. 8 ref. (D general, B22, CN, EG-g)

171-D. Nozzle Replacement From Outside Is Safe and Efficient Method. W. G. McDonough. *Journal of Metals,* v. 6, Apr. 1954, p. 443-446.

Entire interval from time of finish pouring to ladle ready for next heat is 12 to 15 min. As many as five 190-ton heats are tapped in same ladle during an 8-hr. turn. Pouring practice is regularly 96 to 98% good pouring. Photographs, diagram. (D9, ST)

172-D. Steelmaking Processes. Some Future Prospects. C. D. King. *Journal of Metals,* v. 6, Apr. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Apr. 1954, p. 455-465.

Openhearth, Bessemer, turbohearth, Linz-Donawitz and electric-furnace processes evaluated. Tables, diagrams, charts, graphs. (D general, ST)

173-D. Chemical Reactions of Coke in the Iron Blast Furnace. James F. Peters. *Journal of Metals,* v. 6, Apr. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Apr. 1954, p. 466-474.

Solution loss defined; examples show it may either have a favorable or unfavorable effect on blast furnace performance. Theory explaining contradictions encountered during earlier studies. Tables, graphs. 13 ref. (D1, Fe)

174-D. Crucible Melting. *Metal Industry,* v. 84, Mar. 19, 1954, p. 229.

Advantages include low metal loss, good metallurgical conditions, close control of composition of alloys and homogeneity of melt, accurate temperature control, maximum flexibility, low capital cost, economy of floor space and low melting cost. 4 ref. (D8, ST)

175-D. The Low-Shaft Furnace. (Digest of "Exposé Général Sur le Bas Fourneau", H. Malcor; *Revue Universelle des Mines,* 1953, Aug., p. 470.) *Metal Progress,* v. 65, Apr. 1954, p. 190, 192, 194, 196.

Advantages and disadvantages of a low-shaft furnace for reducing iron ore to pig iron. (D8)

176-D. Desulphurization With Rare Earths. *Steel,* v. 134, Apr. 12, 1954, p. 110, 112, 117.

New test data add importance to rare earths in this application. Some heats showed better than 90% desulphurization. Slowing reversion time is a real problem. Photograph, graphs, table.
(D general, B22, EG-g, ST)

177-D. Top Blowing of Basic Bessemer Iron With Pure Oxygen. **F. A.** Springorum, K. G. Speith and W. Oelsen. *Henry Brutcher, Altadena, Calif., Translation no.* 3226, 25 p. (Condensed from *Stahl und Eisen,* v. 73, no. 1, 1953, p. 6-22.)

Previously abstracted from original. See item 111-D, 1953. (D3, CN)

178-D. Experiences With Ingot-Mold Washes. G. Kowarsch. *Henry Brutcher, Altadena, Calif., Translation no.* 3228, 11 p. (Condensed from *Stahl und Eisen,* v. 73, no. 25, 1953, p. 1654-1657.)

Previously abstracted from original. See item 103-D, 1954. (D9)

179-D. (French.) **A Method of Operation for Producing Thomas Steel Low in Nitrogen, Phosphorus, and Sulfur by Means of Oxygen Enriched Air.** P. LeRoy, M. Gombert and B. Trentini. *Revue de métallurgie,* v. 51, no. 1, Jan. 1954, p. 45-72.

Method uses oxygen enrichment of blast, oxidizing additions, a small static height of bath, temperature control and a second slag. Tables, graphs. 10 ref. (D3, ST)

180-D. (French.) **Production of Physically Clean Steel. The P.A.P. Process. L. P. Coatings for Ingot Molds.** J. G. Platon. *Revue de métallurgie,* v. 51, no. 2, Feb. 1954, p. 109-114; disc., p. 114.

Deoxidation with molten aluminum and alkali salt additions permits complete killing of any type of steel. Alkaline flux mold washes improve surface quality. (D9, ST)

181-D. (French.) **Coke Consumption in Blast Furnace.** M. Brun and J. Szczeniowski. *Revue de métallurgie,* v. 51, no. 3, Mar. 1954, p. 154-164; disc., p. 164.

Method of regulating operation based on study of "useful heat of coke". Permits estimation of consumption and output. Graphs.
(D1, B22)

182-D. (French.) **Study of Specimens of Slag Taken From Charges Blown in a Basic Bessemer Converter Without Additions of Lime.** Paul Kozakevitch and Pierre Leroy. *Revue de métallurgie,* v. 51, no. 3, Mar. 1954, p. 203-209.

Slag formed during first few minutes of blowing in absence of lime is acid and iron-bearing. After 16 min. slag becomes basic, is homogeneous and no longer contains metallic iron. Micrographs, tables. 6 ref. (D3, B21)

183-D. (German.) **The Development of Modern Open-Hearth Furnace on the Principle of Maerz System.** Friedrich Wilhelm Morawa. *Metallurgie und Giesserei Technik,* v. 4, no. 1, Jan. 1954, p. 3-12.

Data show lower cost of building and operation. Diagrams, graphs. 12 ref. (D2)

184-D. (German.) **Operating Experiences With a Double Cowper.** G. Naumann. *Metallurgie und Giesserei Technik,* v. 4, no. 1, Jan. 1954, p. 13-15.

Twin stoves render combustion stack superfluous. Diagram. 3 ref. (D1)

185-D. (German.) **Problem of Pig Iron Production in Low-Stack Furnace.** Kurt Säuberlich and Reinhold Baake. *Metallurgie und Giesserei Technik,* v. 4, no. 2, Feb. 1954, p. 55-60.

Successful smelting of low-grade iron ores with low-grade cokes. Methods of overcoming high sulfur content. Tables, diagrams, graph. (D8, CI)

186-D. (German.) **Present Status of Open-Hearth Operation in the German Democratic Republic.** Karl-Friedrich Lüdemann. *Metallurgie und Giesserei Technik,* v. 4, no. 2, Feb. 1954, p. 85-90; disc., p. 90-94.

Investigates output of 32 furnaces. Success of Maerz furnace design; essential features of rapid melting. Graphs. 8 ref. (D2, ST)

187-D. (German.) **Contribution to Metallurgy of Refining Steel by Top-Blowing.** Heinrich Rellermeyer and Theo Kootz. *Stahl und Eisen,* v. 74, no. 7, Mar. 25, 1954, p. 381-395.

Experimental plant and conditions of blowing with air, oxygen-enriched air and pure oxygen. Type and number of heats, blowability and manganese slagging. Tables, graphs, diagrams. 45 ref. (D3, ST)

188-D. The Basic Open Hearth Process. II. Further Theoretical Considerations. G. Reginald Bashforth. *British Steelmaker,* v. 20, Apr. 1954, p. 134-138.

Physical chemistry and thermodynamics of steelmaking and deoxidation. Observations on avoidance of blowholes due to occluded gases. Choice of suitable deoxidizers to prevent nonmetallic inclusions in finished steel. 21 ref. (D2, ST)

189-D. New 10-Ton Arc Furnace for Darwins. *British Steelmaker,* v. 20, Apr. 1954, p. 140-142.

Constructional features of new top-charge electric furnace. Photograph, diagram. (D5, ST)

190-D. Fireclay for Blast Furnaces. Britton T. Day and Richard F. Baley. *Industrial Heating,* v. 21, Apr. 1954, p. 768, 770, 772.

Physical properties discussed in attempt to present a generalization of what constitutes a good fireclay. (D1)

191-D. Flame Radiation and Open Hearth Productivity. M. W. Thring. *Iron & Steel,* v. 27, Apr. 1954, p. 121-123, 132.

Objectives of openhearth furnace research; extent of flame radiation as a factor on openhearth productivity; and relation of input variables to flame radiation. Diagram, table. 3 ref. (D2, ST)

192-D. Electric Furnace Operation. F. S. Leigh. *Iron & Steel,* v. 27, Apr. 1954, p. 133-138.

Trends in modern design of switch gear and furnaces. Photographs. (To be continued.) (D5)

193-D. The Future of Steel Melting. M. W. Thring. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 424-432.

Openhearth furnace brought up to an over-all thermal efficiency of 50% by various steps. Continuous-counter-flow steelmaking process would have theoretical thermal efficiency of 70% on cold metal. Graphs, tables, diagrams. 4 ref. (D2, ST)

194-D. Quality Control in the Production of High-Sulphur Open Hearth Steels. J. H. Flaherty, Jr. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 32, 1953, p. 13-19.

Elimination of silicon in the block and other modifications of practice greatly improved quality of free-cutting steels. Graphs, table, micrographs. (D2, CN)

195-D. Sand for Acid Open Hearths. Douglas C. Williams. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 42-45; disc., p. 51-66.

Composition, behavior and applications of suitable material. Tables. 14 ref. (D2)

196-D. Bottom Repair in Acid Open Hearth Furnaces. J. Benedict Kopec. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 46-51; disc., p. 51-66.

Variables in obtaining good repairs. Tables, graphs. (D2)

197-D. Comments on Quality Problems. Open Hearth vs. Electric Furnace. A. H. Osborne. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 67-68; disc., p. 72-74.

Nitrogen content of rimming electric steel reduced by using pig iron in the charge. Zinc and lead residuals reduced by spiegel, repig or by electrode dipping. (D2, D5, CN)

198-D. Quality of Alloy Steels. Open Hearth vs. Electric Furnace. B. R. Queneau. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 69-70; disc., p. 72-74.

Shows openhearths can produce low-alloy steels with quality approaching electric furnace melts if proper precautions are made. Table. (D2, D5, AY)

199-D. Quality of Similar Grades of Carbon and Alloy Steels, Open Hearth vs. Electric Furnace. Walter Huhn. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 71-72; disc., p. 72-74.

Compares practices at Crucible Steel. (D2, D5, ST)

200-D. Production and Quality of AISI C-1200 Series Screw Steels. S. Feigenbaum. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 75-76; disc., p. 78-79.

Experience shows openhearth screw steels are better quality and more uniform than bessemer grades. Table. (D2, CN)

201-D. Production and Quality of AISI C-1200 Series Screw Steels. I. A. Sirel. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 77-78; disc., p. 78-79.

Furnace practice and experience at Youngstown Sheet and Tube. (D2, CN)

202-D. Rimmed vs. Capped Steel. R. D. Hindson. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 85-87.

Advantages and limitations of both grades for various applications. Photographs. (D2, T general, CN)

203-D. Rimmed and Capped Steels. A. N. Swanson. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 85-87.

Compares yields and characteristics for both mechanically and chemically capped ingots. (D2, CN)

204-D. Factors Affecting Surface Quality of Aluminum-Killed Deep-Drawing Steel Sheets. R. J. Walter. *National Open Hearth Committee of the Iron and Steel Div. of the A.I. M.E., Proceedings,* v. 36, 1953, p. 88-90; disc., p. 95.

Most common defects and remedial procedures. (D2, CN)

205-D. Factors Affecting Surface Quality of Aluminum-Killed Deep-Drawing Sheets. W. R. Huber and E. L. Robinson. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 90-95; disc., p. 95.

Cracking, scabs, deoxidation products, and their prevention. Photographs. (D2, CN)

206-D. Effect of Restricted Uptake Design on Refractory Consumption and Production Rate. E. B. Speer. *National Open Hearth Committee of the Iron and Steel Div. of the A.I. M.E., Proceedings,* v. 36, 1953, p. 111-115; disc., p. 119-120.

Compares refractory and fuel consumption and production rates of redesigned furnaces with normal furnaces in same shop. Diagram, photograph, graphs. (D2)

207-D. Effect of Restricted Uptake Design on Production Rate and Refractories Consumption. M. J. Smith. *National Open Hearth Committee of the Iron and Steel Div. of the A.I. M.E., Proceedings,* v. 36, 1953, p. 116-119; disc., p. 119-120.

Results of current trials at Ford plant. Diagram, graphs. (D2)

208-D. Economics of Port-End Construction. E. B. Speer. *National Open Hearth Committee of the Iron and Steel Div. of A.I.M.E., Proceedings,* v. 36, 1953, p. 121-122; disc., p. 128-129.

Variables to be considered in design. (D2, A4)

209-D. Economics of Port-End Construction. A. J. Voss. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 122-123; disc., p. 128-129.

Experience at Inland Steel with various materials and designs. Tables. (D2, A4)

210-D. Economics of Open Hearth Port-End Construction. A. H. Sommer. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 124-127; disc., p. 128-129.

Costs based on design and use of basic, silica or superduty refractories. Diagram, table. (D2, A4)

211-D. Economics of Open Hearth Furnace Port-End Construction, Large Plants Versus Small Plants. W. J. Scharfenaker. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 127-128; disc., p. 128-129.

Fundamental differences to be considered in different sized plants. (D2, A4)

212-D. Hinged Slag-Pocket Doors. M. H. Weir. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 130-134.

Experience at Sheffield Steel Corp. on replacement of bulkheads with swinging doors. Photographs, table. (D2)

213-D. Use of Special Explosives for Slag Removal. J. O. Dague. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 134-139; disc., p. 142.

Development of satisfactory methods and materials at Bethlehem Steel Co.'s Lackawanna plant. Photographs. (D2)

214-D. Use of Special Explosives for Slag Removal. W. E. Brandt. *National Open Hearth Committee of the Iron and Steel Div. of the A.I. M.E., Proceedings,* v. 36, 1953, p. 140-142; disc., p. 142.

Use of built-in shot holes and mechanical loading reduced removal time to 8 to 16 hr. Diagram, photographs. (D2)

215-D. Steam Jet System for Removal of Flue Dust. John L. Peterson. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 143-146; disc., p. 146.

Savings in time and labor; no decrease in operating efficiency toward end of campaign. Drawing, photographs. (D2, A5)

216-D. Monolithic Refractories in Furnace Spouts. V. W. Jones. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 147-150; disc., p. 155.

Rammed basic lining cuts costs and greatly reduces safety hazards. Photographs. (D2)

217-D. Monolithic Linings Successful at Crucible Steel Company. G. M. Burrier. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 151-153; disc., p. 155.

Practice and experience at Midland Works. Photographs, drawing. (D2)

218-D. Monolithic Refractories in Furnace Spouts at Bethlehem Steel Company. J. C. MacNeill. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 154-155; disc., p. 155.

Practice and experience with rammed linings. Photographs, table. (D2)

219-D. Checker Problems. R. S. Bowers. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 156-157; disc., p. 161-167.

Design, efficiency, and cleaning of checkers. (D2)

220-D. Checker Problems at Inland Steel Company. George C. Lawton. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 159-160; disc., p. 161-167.

Composition of materials and operating practices. Tables. (D2)

221-D. Auxiliary Stack Checkers. Charles N. Straney. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 161; disc., p. 161-167.

Preheating of air before it enters regular checkers decreased fuel consumption. (D2)

222-D. Continuous Oxygen Analysis for Combustion Control in the Open Hearth. F. P. Hubbell. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 169-173; disc., p. 173-176.

Equipment and operating procedures. Diagram, table, photographs, graphs. (D2)

223-D. Atomization of Liquid Fuels as Related to the Overall Operation of Open Hearth Furnaces. G. C. Primm. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 177-179; disc., p. 179-180.

Methods of obtaining desired flame characteristics. Concludes that use of gas or air as atomizing agents is better than change in design of burners and atomizers. Table. (D2)

224-D. Significance, Factors Involved, and Maintenance of Air Preheat. J. H. Kelley and G. E. Wenzel. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 181-184; disc., p. 184-185.

Experience at Bethlehem's Sparrows Point plant illustrates how basic information is translated into practice. (D2)

225-D. Manual Control of Firing Methods. H. W. Potter. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 186-187; disc., p. 187-188.

Design of burners and practice at Lukens Steel Co. Table, diagram, photographs. (D2, S16)

226-D. Scheduling Combustion Practice. J. R. Deppish. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 188-192.

Need and advantages of controlled firing schedules. Table, chart. (D2)

227-D. Manual Control of Firing Rates at the Open Hearth by Roof-Temperature Measurements. L. N. McDonald. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 192-193.

Instrumentation and operation at Edgar Thomson Works. (D2, S16)

228-D. Automatic Open Hearth Roof-Temperature Control. F. S. Swaney. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 193-197; disc., p. 201.

Instrumentation and practice at J & L's Pittsburgh Works. Photographs. (D2, S16)

229-D. Automatic Roof-Temperature Control on Tilting Open Hearth Furnaces. Arthur W. Thornton. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 198-200; disc., p. 201.

Equipment and practice at U.S. Steel's National Works. Table. (D2, S16)

230-D. Front-Wall Rayotube Installation Used at Geneva Works. E. Richards. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 200-201; disc., p. 201.

Installation and experience at U.S. Steel's Geneva Works. (D2, S16)

231-D. Heating Up Open Hearth Furnaces After Rebuilds. Charles N. Jewart. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 202-208.

Experience at Bethlehem Steel compared with industry-wide data. Graphs, photographs, drawing. (D2)

232-D. Open Hearth Furnace Design at Fairless Works. H. A. Parker. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 209-215; disc., p. 217-219.

Design and arrangement of furnaces and auxiliary equipment. Photograph, diagrams. (D2)

233-D. Recent Trends in Furnace Design in New Plants. A. K. Moore. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 215-217; disc., p. 217-219.

Shop and furnace improvements at Steel Co. of Canada's No. 3 shop. (D2)

234-D. New Bottoms and Refractories Used in Bottom Repair. J. F. Pollack. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 220-221; disc., p. 223.

Materials and methods for eliminating bottom troubles. (D2)

235-D. New Bottoms and Refractories Used in Bottom Repairs. A. M. Kroner. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 221-223; disc., p. 223.

Advantages of fully rammed bottoms. Practice and experience at Inland Steel. (D2)

236-D. Significance Study of Open Hearth Variables. W. R. Weaver. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 224-225; disc., p. 226-229.

Multiple correlation technique of statistical analysis. Its application covering 23 variables in 125 heats. Graphs, table. (D2, S12)

237-D. Productivity by the Use of Oxygen as Complicated by Sulphur Limitations. J. E. Hood. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 230-232.

Advantages and limitations of lancing operations. Tables. (D2)

238-D. Productivity by Use of Oxygen Lance as Complicated by Sulphur Limitations. L. R. Berner. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 233; disc., p. 233-234.

Experience at Inland Steel's No. 2 plant. Table. (D2)

239-D. Jet Tappers. R. W. Smith. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 234-235; disc., p. 235-236.

Advantages and savings obtained at U.S. Steel's Gary Works. (D2)

240-D. Hydraulically Operated Ladle Stoppers. T. J. Hoby. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 236-244.

Construction, operation and advantages of Autopour ladle equipment. Diagram, photographs, table. (D9)

241-D. Comparison of the Electric and Open Hearth Furnaces on an Economic Basis. T. R. Scott. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 245-247; disc., p. 251-252.

Data from openhearths and new electric installation at Sheffield Steel. (D2, D5, ST)

242-D. Economics of Electric Furnace vs Open Hearth With All Cold Metal Charge. J. E. Wilbanks. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 248-249; disc., p. 251-252.

Experience at Atlantic Steel Co. indicates lower cost for electric furnace when same grades are produced in all cold metal practice. Table. (D2, D5, ST)

243-D. Comparative Economics of Open Hearth and Electric Furnace Operation. C. L. King. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 250-251; disc., p. 251-252.

Good competitive position of electric furnace is indicated by experience at Kansas City plant of Sheffield Steel. (D2, D5, ST)

244-D. Effect of Reduced Aluminum Deoxidation on Cast Steel. A. W. Fastabend. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 253-260; disc., p. 260-261.

Practice resulted in lower tendency to hot tearing. Graphs, tables, diagram. 5 ref. (D2, CI)

245-D. Factors in Producing Quality Steel. C. F. Henzelman. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 262-264; disc., p. 264-265.

Factors leading to desired quality, including pouring practice. (D2, D9, ST)

246-D. Rammed and Castable Refractories for Open Hearth Service. R. R. Fayles. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 265-267; disc., p. 267-269.

History and recent developments point to increasing use. (D2)

247-D. Recarburizing Heats With Coal or Coke Injected by Compressed Air. R. C. Buehl, R. J. Leary and E. J. Ostrowski. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 269-275; disc., p. 275-278.

Tests made in laboratory furnace indicate practice is effective, rapid and convenient. Table, diagram, photograph, graphs. (D2, ST)

248-D. Taboos Slag Pocket Build-Up. *Steel,* v. 134, Apr. 26, 1954, p. 112, 115.

Reflectors in openhearth slag pockets free gas of entrained solids and eliminate need for lancing of checker system. Photo, diagram. (D2)

249-D. (English.) **High-Speed Steels, Their Origin, Development and Prospects.** *Aciers Fins & Spéciaux Francais,* 1954, no. 16, Feb., p. 23-27.

History and production of different steel alloys in various countries. Photographs.
(D general, AY, Cr, W, Co, Mo)

250-D. Industry Looks at Oxygen Blown Steel. *Steel,* v. 134, May 3, 1954, p. 104, 106, 109, 110, 113.

Techniques and advantages of an Austrian converter process. (D3, ST)

251-D. (German.) **Problems of Pig Iron Production.** S. Henkel. *Metallurgie und Giesserei Technik,* v. 4, no. 3, Mar. 1954, p. 101-105.

Bloomery process preferred for smelting low-grade acid ores over low-shaft furnace because of greater economy and lower coke consumption. Tables, diagrams. 22 ref. (D8, D1, CI)

252-D. (Hungarian.) **Uniformity in the Change of Hydrogen Content of Openhearth Steel.** Jozsef Verö. *Kohaszati Lapok,* v. 9, no. 3, Mar. 10, 1954, p. 100-101.

Theoretical considerations, based on work by Piper, show increase of hydrogen content follows regular pattern. Graphs. (D2, ST)

253-D. (Book.) **National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings, (Annual Volume),** v. 36, 1953. 303 p. American Institute of Mining and Metallurgical Engineers, 29 West 39th St., New York 18, N. Y.

Includes 67 technical papers which are individually abstracted. (D2, ST)

254-D. Construction of the Largest Blast Furnace in Europe Completed in Record Time. David R. Knall. *Blast Furnace and Steel Plant,* v. 42, May 1954, p. 524-530.

Design and installation of plant in Dortmund, Germany. Diagrams, photographs. (D1)

255-D. The Use of Oxygen in the Iron and Steel Industry. Steelmaking in the Converter Using Oxygen. II. Georg Bulle. *Blast Furnace and Steel Plant,* v. 42, May 1954, p. 531-536.

Definite advantages with increased production. Diagrams, photograph. (D3)

256-D. (French.) **Non-Manganese and Semi-Manganese Pig Irons. Technical and Economic Comparison of Use in Basic Bessemer Converter.** Rajon and Tavard. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* 1954, no. 3, p. 549-560.

Studies ordinary steels prepared by addition of ferromanganese with 75% Mn. Effect of consumption of ferromanganese, lime, scrap, sodium carbonate and pig iron on linings. Influence of increase of manganese content in pig on quality of steel. Graphs, tables. (D3, CN)

257-D. (Italian.) **Problems of Solidification and Segregation in Killed and Unkilled Steels.** Bernhard Matuschka. *Metallurgia italiana,* v. 46, no. 2, Feb. 1954; *Atti notizie (AIM),* v. 9, no. 2, Feb. 1954, p. 50-58; disc., p. 58-60.

Systematic study of ingot defects and their control. Graphs, photographs, micrographs, diagrams. (D9, ST)

258-D. (Russian.) **Electrolysis of Liquid Iron Containing Slags.** O. A. Esin and P. M. Shurygin. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1145-1147.

Method of cathodic reduction. Diagrams, graph. 7 ref. (D8, Fe)

259-D. (Russian.) **Investigation of the Distribution of Gaseous Flow in a Blast Furnace Using a Model.** N. N. Chernov. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 1, Jan. 1, p. 80-91.

Design of model and method of study on experimental installations. Tables, diagrams, graph. 3 ref. (D1)

260-D. Electric Furnace Operation. F. S. Leigh. *Iron & Steel,* v. 27, May 1954, p. 169-174.

Trends in modern design. Considers electrodes, fume disposal, magnetic stirrer and special-purpose furnaces. Photographs, diagram, oscillogram. (D5)

261-D. Iron and Steel Making Processes Used in Sweden. Sven Fornander. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 1-12.

Various processes for making pig

iron, sponge iron and ingot steel. Emphasis on scarcity of fossil fuel and relatively large resources of hydro-electric power. Maps, graphs, photograph, tables, diagrams. 56 ref. (D general, Fe, ST)

262-D. Reduction of Iron Ore Without Melting in a Rotary Furnace. Bo Kalling and Folke Johansson. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 76-85.

Construction and results of new type furnace and its possibilities in steelmaking. Diagrams, photographs, tables. 6 ref. (D8, Fe)

263-D. Correlating Blast Furnace Operating Concepts. Charles Agnew. *Steel,* v. 134, May 17, 1954, p. 106 + 4 pages.

Generation, distribution, recovery and use of heat are important factors governing proper coke combustion. Table, photographs. 4 ref. (D1)

264-D. (French.) **Committee of Engineers for Basic Bessemer and Other Furnaces. Storage Tests in Cowper Apparatus.** *Centre de Documentation Siderurgique, Circulaire d'informations Techniques,* v. 11, no. 4, 1954, p. 721-734.

Results of tests on Brohlthal and Petit a Senelle cowpers. Graphs, tables, diagrams. (D3)

265-D. (French.) **Committee of Engineers for Basic Bessemer Steel Mills. I. Oxygen-Enriched Blasting Tests at Moyeuvre.** Trentini. **II. Mechanism of the Fertilizing Action of Basic Bessemer Slags.** Barbier. **III. Dilling's Tests on Oxygen-Enriched Blasts.** Buey. **IV. Some Remarks on the Production of Converter Bottoms.** Delong. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* v. 11, no. 4, 1954, p. 753-769.

Industrial possibilities offered by enriched blast. Tables, graphs, photographs. (D3, ST)

266-D. (French.) **Committee of Engineers for Open-Hearth Furnaces. Control of Slag in the Basic Open-Hearth Furnace.** Bernard. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* v. 11, no. 4, 1954, p. 771-778.

Relationship between composition of slag, elimination of carbon, phosphorus and sulfur and recovery of manganese. (D2, AY)

267-D. (French.) **The Investigation of Heterogeneity of Forging Ingots.** M. Nepper. *Revue universelle des mines,* v. 10, ser. 9, no. 4, Apr. 1954, p. 96-99.

Relationship between shape and degree of heterogeneity established in 20-ton bessemer carbon steel ingots. Table, photographs, diagrams. (D3, D9, CN)

268-D. (German.) **The Oxygen Contents of Molten Steels From the Basic Converter, Openhearth and Electric Furnace.** Karl Georg Speith and Hans vom Ende. *Stahl und Eisen,* v. 74, no. 9, Apr. 22, 1954, p. 509-525.

Steel blown with air, 30% oxygen and pure oxygen. Dependence on composition of slag and alloy content. Graphs, tables. 83 ref. (D3, D2, D5, ST)

269-D. (German.) **Repair of Basic Openhearth Furnaces With Machines. I. Patching With Blaw-Knox Machines.** Wolfgang Schleicher. **II. Operation of Brieden Type Dolomite Guns.** Ewald Friemann and Günter Evers. **III. The BRI Dolomite Sprayer.** Max Hauck. **IV. Repairing With the Blaw-Knox Machine.** Heinrich Clees. *Stahl und Eisen,* v. 74, no. 10, May 6, 1954, p. 620-623.

Includes photographs, diagram, table. (D2)

270-D. (German.) **Reconstruction of Four Blast Furnaces in the Salzgitter Smelting Plant.** Wilhelm Ingenerf. *Stahl und Eisen,* v. 74, no. 10, May 6, 1954, p. 649-651.

Changes during repair of American-designed furnaces. Diagrams, photograph. (D1)

271-D. Effect of Physical and Chemical Properties of Coke on Its Combustion. R. A. Mott. *Coke and Gas,* v. 16, May 1954, p. 189-194.

Principles underlying combustion in blast furnace. Graphs, tables. 17 ref. (D1)

272-D. The Electric Furnace West of the Rockies. W. B. Wallis. *Iron and Steel Engineer,* v. 31, May 1954, p. 80-86.

Low cost advantages of electric furnace compared to openhearth. Graphs, photographs. (D5, D2)

273-D. The Manufacture of Rimming Steels. H. N. Bowen. *Iron and Steel Institute; Papers of the Affiliated Local Societies, Special Report no.* 49, Feb. 1954, p. 9-21.

Furnace, raw materials, desulfurization and effects of various factors on refining. Tables, photographs, diagrams, graph. 4 ref. (D2, ST)

274-D. Some Factors Affecting Open-Hearth Steelplant Performance. J. S. Curphey. *Iron and Steel Institute; Papers of the Affiliated Local Societies, Special Report no.* 49, Feb. 1954, p. 43-54.

Importance of shop and stockpile layout, effect of increasing propor-

tion of hot metal in furnace charges, slag bulk and flushing practice and factors affecting efficiency of fuel combustion. Charts, diagrams, tables. (D2, ST)

275-D. Scale Additions Reduce Phosphorus and Nitrogen in Basic Bessemer Steel. (Digest of "Development at Corby of Basic Bessemer Steel Low in Nitrogen and Phosphorus by Scale Additions During the Blow", by W. A. Smith; *Journées Internationales de Sidérurgie,* 1953, Apr., p. 547-562.) *Metal Progress,* v. 65, June 1954, p. 146 + 4 pages.

Low-grade high-phosphorus ores used economically with this process. (D3, ST)

276-D. Comparison of Costs in Openhearth and Electric Furnace Shops. (Digest of "Comparative Economics of Openhearth and Electric Furnaces for Production of Low-Carbon Steel", by S. L. Case, D. D. Moore, C. E. Sims and R. J. Lund; *Electric Furnace Survey Group and Bituminous Coal Research, Inc.* Published by Bituminous Coal Research, Inc., Pittsburgh.) *Metal Progress,* v. 65, June 1954, p. 174-176.

Comparative cost and operating features of modern openhearth and electric furnaces of equal output. Table. (To be continued.) (D2, D5)

277-D. Sponge Iron and Direct-Iron Processes. Edward P. Barrett. *U. S. Bureau of Mines Bulletin* 519, 1954, 143 p.

Laboratory and commercial experience. Conditions under which processes may be practical. Tables, diagrams, photographs, graphs. 451 ref. (D8, Fe)

278-D. (French.) **Oxygen Combustion Tests on an Openhearth Furnace Fired With Enriched Coke-Oven Gas.** G. Husson and J. Donney. *Revue de métallurgie,* v. 51, no. 4, Apr. 1954, p. 283-290; disc., p. 290.

Increased production and fuel economy. Wear on refractories. Diagrams, tables, photographs. (D2)

279-D. (Swedish.) **The Mechanism of Reduction of Magnetite and Hematite.** John Olof Edström. *Jernkontorets Annaler,* v. 138, no. 4, 1954, p. 177-224.

Low strength of pure hematite ores and of well-oxidized, burnt, rich-ore pellets during reduction with carbon monoxide due to pore formation, expansion and disintegration of structure. Tables, graphs, micrographs, diagram. 68 ref. (D general, Fe)

280-D. (Book.) **Ferrous Process Metallurgy.** John L. Bray. 414 p. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $6.50.

Covers raw materials; steel making furnaces and processes; and ingot practice. (D general)

281-D. Some Statistical Methods Used in Studies of Steel Plant Operations. A. P. Woods. *Blast Furnace and Steel Plant,* v. 42, June 1954, p. 649-652, 665.

Application to management problems regarding use of available plant equipment and investment for plant improvement and expansion. Graphs. 3 ref. (D general, A5, S12, ST)

282-D. Significance of Minor Elements in Iron-Bearing Raw Materials for Integrated Steel Plants. C. B. Jacobs, J. F. Elliott and M. Tenenbaum. *Blast Furnace and Steel Plant,* v. 42, June 1954, p. 666-674, 679, 688.

Origin, elimination and effect on finished product. Tables, graphs. 10 ref. (D general, B general, Fe)

283-D. Continuous, Automatic Iron Casting. *Canadian Metals,* v. 17, May 20, 1954, p. 24, 26.

Saves labor, raw materials, loss from rejects and overhead of quality control. Photographs. (D9, CI)

284-D. Mixer Operation and Its Relation to Slopping in the Acid Bessemer Converter and to the Opening Bath Sulphur in the Duplex Process. H. Schrader and S. Visvanathan. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 22-52; disc., p. 52-53.

Behavior of slags employed in a hot metal mixer for low-manganese duplex iron. Tables, diagrams, graphs. 23 ref. (D3, D7, Fe)

285-D. Mill Gives Dornin Process First Big Test. G. A. Dornin, Jr., R. H. Spence and W. H. Meyer. *Iron Age,* v. 173, June 17, 1954, p. 141-144.

Sound ingots produced without hot tops. Yield per ingot is about 12% higher. Diagrams, photographs. (D9, ST)

286-D. Kinetics of Low-Temperature Reduction of Iron Ores. Reduction of Chemically Pure Ferric Oxide With Hydrogen. S. T. Rostovtsev and A. P. Em. *Henry Brutcher, Altadena, Calif., Translation* no. 3217, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 93, no. 1, 1953, p. 131-134.)

Reduction kinetics at temperatures of 525-750° F. Graphs, table. 3 ref. (D1, Fe)

287-D. Kinetics of Low-Temperature Reduction of Iron Ores. Reduction of Synthetic and Natural Iron Ores With Hydrogen. S. T. Rostovtsev and A. P. Em. *Henry Brutcher,*

Altadena, Calif., Translation no. 3218, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 93, no. 2, 1953, p. 329-332.)

Previously abstracted from original. See item 60-D, 1954. (D1, Fe)

288-D. Behavior of Hydrogen in Steel Making. E. Piper, H. Hagedorn and H. Backes. *Henry Brutcher, Altadena, Calif., Translation no.* 3235, 27 p. (From *Stahl und Eisen,* v. 73, no. 13, 1953, p. 817-825.)

Previously abstracted from original. See item 277-D, 1953. (D general, S11, ST)

289-D. Refining of Steel With Pure Oxygen by the Top Blowing (LD) Process. H. Trenkler. *Henry Brutcher, Altadena, Calif., Translation no.* 3238, 28 p. (Slightly condensed from *Revue Universelle des Mines,* v. 96, ser. 9, no. 8, Aug. 1953, p. 644-657.)

Production of steel with very low phosphorus, sulfur, nitrogen and oxygen contents by blowing 98% pure oxygen onto surface of bath. Tables, graphs, diagrams, sulfur prints. 17 ref. (D3, CN)

290-D. (French.) **New Charging Apparatus for Blast Furnaces.** Daniel Petit. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 5, 1954, p. 917-925.

Application of rotating top-bell. Diagrams. (D1)

291-D. (French.) **Duffield Process for the Production of Pig Iron.** G. Zuliani. *Journal du Four Electrique,* v. 63, no. 2, Mar.-Apr. 1954, p. 45-46.

Direct reduction of ore in electric furnaces. Tables. (D5, CI)

292-D. (French.) **Observations on the Working of Blast Furnaces on Sinter and Lorraine Ore.** J. Szczeniowski and P. Thierry. *Revue de métallurgie,* v. 51, no. 5, May 1954, p. 305-324; disc., p. 324-325.

Poorer permeability, high flame requirement and cooling difficulties. Effects of burden enrichment. Graphs, tables, diagrams. (D1, CI)

293-D. (German.) **The Smelting of Iron Ore in the Rotary Furnace.** Wilhelm Böddeker. *Metallurgie und Giesserei Technik,* v. 4 no. 4, Apr. 1954, p. 148-157.

Smelting of low-grade ore with low-grade coal in Sturzelberg. Experimental plant, details of experiments and operation of the rotary furnace. Diagrams, tables, charts. 14 ref. (D8, Fe)

294-D. (Hungarian.) **The Production of Steels Free of Cavitation and Liquation.** Ernö Weigl. *Kohaszati Lapok,* v. 9, no. 5, May 10, 1954, p. 207-216.

Causes of cavitation. Details of continuous casting process and its effects on quality of the steel and possible savings in material. Tables, charts, diagrams. (D9, ST)

295-D. (Swedish.) **A Process for Reduction of Iron Ore in a Rotary Furnace Without Melting.** Bo Kalling and Folke Johansson. *Jernkontorets Annaler,* v. 138, no. 5, 1954, p. 253-270.

Desulfurization of sponge iron. Possibilities for steelmaking. Tables, diagrams, photographs. 6 ref. (D8, Fe)

296-D. The Oxygen Steel Making Process. F. J. McMulkin. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 506, June 1954, p. 381-385; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 225-229.

Principles, reactions, removal of phosphorus and sulfur, yield and quality of end product. Diagram, graph, tables. 4 ref. (D8, ST)

297-D. Regenerator Efficiency and Air Preheat in the Open Hearth. VI. B. M. Larsen. *Industrial Heating,* v. 21, June 1954, p. 1142, 1146, 1148, 1150.

Satisfactory method of openhearth control. (To be continued.) (D2)

298-D. Electric Steel Production. I. Sulphur and Hydrogen Removal. D. D. Howat. *Iron & Steel,* v. 27, June 1954, p. 223-227.

Expansion and advantages. Methods of eliminating impurities. 48 ref. (To be continued.) (D5, ST)

299-D. The Role of Aircraft Research in Furnace Design. II. The Application of Aerodynamics to O-H. Development. J. H. Chesters. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 246-251.

Development of sloping-end furnace. Flow patterns in model and full-scale furnaces. Photographs, diagrams. 15 ref. (D2)

300-D. Economics of Melting. The Battelle Electric Furnace Report Reconsidered. J. C. Howard. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 252-255.

Reviews "Comparative Economics of Open-Hearth and Electric Furnace for the Production of Low Carbon Steel". Considers application of conclusions to conditions in Great Britain. Photographs, tables. 5 ref. (D2, D5)

301-D. Graphite Electrodes. Some Factors Affecting Their Wear in Service. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 269-272; disc., p. 324-327.

Mechanism of wear. Nondestructive testing of electrodes. Tables, graphs, photographs, diagram. (D5, Q9, C)

302-D. Fairless Works. United States Steel's Newest. T. J. Ess. *Iron and Steel Engineer,* v. 31, June 1954, p. F62-F92.

Raw materials, coke plant, blast furnaces, openhearths, rolling mills and tube mills. Photographs, diagram, tables.
(D general, F23, F26, ST)

303-D. Determination of the Optimum Current in an Arc Furnace. W. E. Schwabe. *Iron and Steel Engineer,* v. 31, June 1954, p. 87-89; disc., p. 89-90.

Method of setting circuits to match the arc voltage to the impedance. Diagrams, graph. (D5)

304-D. Republic's New Open Hearth Furnaces at Cleveland. E. C. McDonald. *Iron and Steel Engineer,* v. 31, June 1954, p. 99-104; disc., p. 104-106.

Buildings and equipment. Diagrams, photographs. (D2, ST)

305-D. New Open Hearth Furnaces at Stelco. E. T. W. Bailey. *Iron and Steel Engineer,* v. 31, June 1954, p. 91-98; disc., p. 98.

Equipment and operating procedures. Plant layout, photographs, tables. (D2, ST)

306-D. Correlating Blast Furnace Operating Concepts. II. Charles E. Agnew. *Steel,* v. 134, June 21, 1954, p. 142 + 6 pages.

Relationship between burden preparation and smelting capacity. Tables. (To be continued.) (D1)

307-D. New Exothermic Technique for Pouring Ingots. Pierre Venard. *Steel,* v. 134, June 28, 1954, p. 111, 114, 122.

Cast iron hot tops lined with exothermic flat refractory plaques effect a reduction in feedhead and a 10% increase in sound metal above ingot neck. Photographs. (D9, ST)

308-D. Computation of the Rate of Solidification of an Ingot Taking Into Account the Temperature Dependence of the Thermophysical Parameters of the Metal. B. Ya. Lyubov. *National Science Foundation Translation,* no. 227, Feb. 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 92, 1953, p. 763-766.)

Previously abstracted from original. See item 129-D, 1954. (D9)

309-D. On the Best Ways of Deoxidizing Molten Steel. W. Koch and F. Wever. *Henry Brutcher, Altadena, Calif., Translation no.* 3268, 18 p. (Condensed from *Stahl und Eisen,* v. 74, no. 5, 1954, p. 264-271.)

Previously abstracted from original. See item 155-D, 1954. (D5, ST)

310-D. Refractories for the Bottom-Pouring of Steel. G. G. Aristov. *Henry Brutcher, Altadena, Calif., Translation no.* 3271, 12 p. (From *Ogneupory,* v. 17, no. 8, 1952, p. 364-370.)

Importance of quality refractories for minimum dirt content in steel ingots. Photographs, tables. 8 ref. (D9, ST)

311-D. Ladle Treatment of Hot Metal for Basic Converter With Oxygen. K. Heinrich. *Henry Brutcher, Altadena, Calif., Translation no.* 3283, 5 p. (From *Revue Universelle des Mines,* v. 96, ser. 9, no. 8, Aug. 1953, p. 637-639.)

Treatment of metal in ladle between blast furnace and steel plant, either before or after the mixer, with 80 to 90% pure oxygen. Graphs, photograph. (D1)

312-D. Developments in Blast Furnace Design. S. K. Nanavati and P. K. Chatterjee. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 23-46; disc., p. 46-50.

History of blast furnace design and operation. Tables, diagrams. (D1)

313-D. Pig Iron Smelting Without Metallurgical Coke. W. E. Krebs and D. Jagat Ram. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 51-67; disc., p. 67-76.

New combined rotary kiln process for noncoking coal. Developments in pig iron smelting with oxygen low-shaft furnaces. Photographs, diagrams, graphs. 11 ref.
(D1, D8, Fe)

314-D. Ferromanganese Furnace Fumes Cleaned Successfully. C. H. Good, Jr. *Iron Age,* v. 174, July 8, 1954, p. 95-97.

Equipment and methods for cleaning furnace gases at Duquesne Works of U. S. Steel Corp. Photographs, diagram. (D1, A7)

315-D. Carbide Drilling Speeds Removal of Tough Slag Deposits. D. L. Tunsberg. *Iron Age,* v. 174, July 8, 1954, p. 98-99.

Use of tungsten carbide bits proved fastest and cheapest way of drilling holes for blasting slag from stack of blast furnace. Diagram, photographs. (D1)

316-D. European Oxygen Steelmaking Is of Far-Reaching Significance. H. B. Emerick. *Journal of Metals,* v. 6, July 1954, p. 804-806.

Enrichment of compressed air used in blast furnace operation, enrichment of air blast in bottom-blown basic bessemer practice, prerefining of basic iron in the hot metal ladle, nitrogen-free mixtures of high-purity oxygen and steam in basic bessemer practice and top

blowing in solid-bottom basic lined converters. Photographs. 8 ref. (D1, D3, CN)

317-D. Operating Experience With a Two-Foot Diameter Blast Furnace. Russell C. Buehl. *Journal of Metals,* v. 6, July 1954, p. 814-816.

Furnace features, operation on various ores and sinters. Photograph, diagram. 3 ref. (D1)

318-D. Development of Oxygen Steelmaking. Otwin Cuscoleca. *Journal of Metals,* v. 6, July 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, July 1954, p. 817-827.

Review of process and survey of results at two Austrian plants where steel is blown with high-purity oxygen. Photographs, diagrams, graphs, tables. 37 ref. (D3, ST)

319-D. On the Basic Bessemer Process. Pierre Coheur and Hans Kosmider. *Journal of Metals,* v. 6, July 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, July 1954, p. 829-835.

Processes of blowing with oxygen-enriched air or gas mixtures of oxygen and steam allow steelmaker to produce, in a basic converter, a rimmed steel low in nitrogen (0.0020%), phosphorus (0.020%) and sulfur (0.020%). Diagrams, graphs, tables. (D3, CN)

320-D. Comparison of Costs in Openhearth and Electric Furnace Shops. (Digest of "Comparative Economics of Openhearth and Electric Furnaces for Production of Low-Carbon Steel", by S. L. Case, D. D. Moore, C. E. Sims and R. J. Lund; *Electric Furnace Survey Group and Bituminous Coal Research, Inc.* Published by Bituminous Coal Research, Inc., Pittsburgh. *Metal Progress,* v. 66, July 1954, p. 168 + 4 pages.

Comparison of overhead and material costs per ton of ingots. (To be continued.) (D2, D5)

321-D. (French.) **Reducing Wear of Ladle Linings, Particularly by Reducing Amount of Slag.** Pigeau. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 6, 1954, p. 1119-1128.

Effects of height of slag layer, shape of ladle and composition of mortar on lining life. Diagrams, tables, graph. (D9)

322-D. (Polish.) **Causes of Premature Failure of Silica Roofs of Openhearth Furnaces.** Stanislaw Pawlowski. *Hutnik,* v. 21, no. 4, Apr. 1954, p. 91-100.

Quality and selection of materials, fire resistant mortar and thickness of seams, surface glaze and effect of overheating and overloading. Tables, graphs, photographs. 17 ref. (D2)

323-D. (Polish.) **Definition of Combustion Zone Before the Tuyere of the Blast Furnace.** Wladyslaw Kuczewski. *Hutnik,* v. 21, no. 4, Apr. 1954, p. 100-102.

Precise formulation based on previous studies. Diagram, graphs. 4 ref. (D1)

324-D. (Polish.) **Use of Steam or Hot Water for Cooling Openhearth Furnaces.** W. Krause. *Hutnik,* v. 21, no. 4, Apr. 1954, p. 108-114.

Design for cooling 60-ton furnace, securing high-pressure steam, utilizing heat of water cooling and products of combustion and utilization of waste heat by use of La Mont boilers. Diagrams, tables, photographs. 4 ref. (D2)

325-D. (Russian.) **Investigation of Desulfurization of Pig Iron by Means of Sodium Carbonate.** O. V. Travin and L. A. Shvartsman. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 12, Dec., p. 1804-1812.

Laboratory investigation to establish mechanism and regularities. Application of radioactive sulfur. Tables, graphs. 4 ref. (D1, CI)

326-D. (Book—German.) **(The Preparation of the Blast-Furnace Burden, Including the Blast-Furnace Coke.) Die Vorbereitung des Hochofenmöllers einschliesslich der des Hochofenkokses.** W. Luyken. 377 p. 1953. Springer Verlag, Berlin, Germany. DM 37.50.

Processes used after the mining of the raw materials to make pig iron production more economical. The types of burden materials, preparation of the iron ores and coking coal, preparation and properties of blast-furnace coke, and various installations. (D1, B22, Fe)

327-D. The Use of Manganese Sulphide to Improve the Hot Workability of Steel. Simon Feigenbaum. *Foote Prints,* v. 26, no. 1, 1954, p. 3-6.

Effects of sulfur additions on hot rolling behavior. Results of production heats. Photographs. (D2, F23, CN)

328-D. Foote "Rimex" Improves Quality of Deep Drawing Steels. Anthony C. Demos. *Foote Prints,* v. 26, no. 1, 1954, p. 7-10.

Advantages of use of rimming agent include low cost, improved rimming action, and absence of noxious fumes. Photographs, diagram. (D2, ST)

329-D. Regenerator Efficiency and Air Preheat in the Open Hearth. VII.

B. M. Larsen. *Industrial Heating,* v. 21, July, 1954, p. 1350, 1352, 1354.

Design of an aspirating thermocouple for use in obtaining temperatures for calculating regenerator efficiency. Diagram. (D2, S16)

330-D. Electric Steel Production. II. Chromium in Electric Furnace Steel. D. D. Howat. *Iron & Steel,* v. 27, July 1954, p. 341-345.

Chromium-oxygen equilibrium relations; distribution of chromium between metal and slag; refining of high-chromium steels. Tables. 34 ref. (D5, P12, Cr, AY)

331-D. The Formation and Decomposition of Fayalite (2 FeO · SiO_2). B. G. Baldwin. *Iron and Steel Institute, Journal,* v. 177, July 1954, p. 312-316.

Effect of particle size, time of heating, and temperature on formation from mixtures of ferrous oxide and silica. Effect of fayalite on the blast furnace process. Diagram. 4 ref. (D1, B22)

332-D. Steel Melting. ASM Committee on Melting. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 154-158.

Bessemer process, basic openhearth and electric furnace, oxygen treatment, ingot and pouring practice, continuous casting, and vacuum and atmosphere melting. Diagrams, photograph. (D general, ST)

333-D. Oxygen Converter Steel. Another Step Closer to U. S. Debut. W. C. Rueckel and W. A. Vogt. *Steel,* v. 135, July 19, 1954, p. 110, 112, 114.

Review of use of oxygen in bessemer process. Oxygen requirements; heat balance. Advantages and disadvantages. Photograph, graphs, tables. (D3, CN)

334-D. Swedish Induction Stirring Process. *Times Review of Industry,* v. 8, new ser., July 1954, p. 111.

Description of equipment and its operation. Use in electric steelmaking. Photograph, diagrams. (D5)

335-D. (German.) **Lines of Development in Heat and Power Economy of the Iron and Steel Industry.** Ernst Krebs. *Stahl und Eisen,* v. 74, no. 13, June 17, 1954, p. 813-822.

Literature review on efficiency of power plants, gas generators, and heat consumption. Graphs, diagrams. 63 ref. (D general)

336-D. (Slovenian.) **Course of Deoxidation and Formation of Inclusions.** W. Koch. *Rudarsko-Metalurski Zbornik,* 1954, no. 1, p. 3-26.

Experiments on introducing deoxidizing agents in tubes inserted into the molten steel. Photographs, micrographs, graphs, tables, diagrams. 3 ref. (D2, ST)

337-D. Blast Furnace Design Problems. Fred E. Kling. *Blast Furnace and Steel Plant,* v. 42, July 1954, p. 778-786.

Design of furnaces and auxiliary equipment. Diagrams, graphs, tables. (To be continued.) (D1)

338-D. Coke Plant and Blast Furnace Expansion at Fontana. Clarence R. Lohrey. *Iron and Steel Engineer,* v. 31, July 1954, p. 67-69.

Increased production facilities and quality of products. Tables, graphs. (D1, B22, ST)

339-D. Trends in Blast Furnace Linings. Hobart M. Kraner. *Iron and Steel Engineer,* v. 31, July 1954, p. 79-81; disc., p. 82.

Increasing demands by blast furnace operator push ingenuity of ceramic engineer and manufacturer. Diagrams. 7 ref. (D1)

340-D. Cleaning of Open Hearth Checkers and Sewers During Operation. R. M. Jordan. *Iron and Steel Engineer,* v. 31, July 1954, p. 98-101; disc., p. 101-102.

Use of water and air to blow checker openings and installation of agitators to blow the sewers. Photographs, diagrams. (D2)

341-D. (English.) **Continuous Casting of Steel on an Industrial Scale.** *Aciers Fins & Spéciaux Francais,* 1954, no. 17, June, p. 60-63.

Plant operation, production and special tests. Photographs. (D9, ST)

342-D. (English.) **Usinor.** *Aciers Fins & Spéciaux Francais,* 1954, no. 17, June, p. 123-126.

Production of carbon and special steels by basic bessemer, openhearth and electric process by the Union Sidérurgique du Nord de la France. Photographs. (D3, D2, D5, CN, AY)

343-D. (Czech.) **Evaluation of Technical Data on Coking Plants and Blast Furnaces in the First Five-Year Plan.** Ladislav Sajch and Frantisek Väna. *Hutnické Listy,* v. 9, no. 6, June 1954, p. 321-327.

Czechoslovakian coke yield and quality, blast furnace charging practice; pig iron production statistics. Tables, graphs. (D1, B22, A4, CI)

344-D. (Czech.) **Treatment of Pig Iron After Tapping to Recover Vanadium.** F. Houdek and M. Oppelt. *Hutnické Listy,* v. 9, no. 6, June 1954, p. 327-333.

Development of process for recovering vanadium from slag. Photographs, tables, graphs. (D1, A8, CI, V)

345-D. (Czech.) **Experiences With Soviet Apparatuses Used for Steel-Melting Furnaces in the NHKG.** J. Stary. *Hutnické Listy,* v. 9, no. 6, June 1954, p. 333-341.

Temperature control equipment and its operation. Diagrams. (D8, S16, ST)

346-D. (Czech.) **Treatment of Stainless Steel Scrap by Melting in Basic Openhearth Furnace.** Antonin Danihelka. *Hutnické Listy,* v. 9, no. 6, June 1954, p. 341-348.

Study of three remelting processes for recovery of scrap elements. Best procedure was duplexing in openhearth and electric furnaces. Diagrams, tables. (D7, A8, SS)

347-D. (German.) **Comparison of Various Forms of Openhearth Furnaces.** Reinhold Baake. *Metallurgie und Giessereitechnik,* v. 4, no. 5, May 1954, p. 222-223.

Comparison of East German and Russian furnaces. Diagrams. 1 ref. (D2)

348-D. Electric Ingot Steel. Old Process Solves Jet Age Problem. *Steel,* v. 135, Aug. 9, 1954, p. 106, 108.

Advantages of electric ingot process for production of superalloys. Process involves continuous melting and casting and progressive solidification. Photographs, diagrams. (D9, AY)

349-D. Wheeling Steel Corporation's Steubenville Works. Charles Longenecker and Harry E. Trout. *Blast Furnace and Steel Plant,* v. 42, Aug. 1954, p. 901-927.

Plants and equipment, including blast furnaces, openhearth furnaces, blooming mills, hot strip mills, galvanizing plants, coke plant, Bessemer converters, etc. Photographs, diagrams, tables.
(D general, F general, A5, ST)

350-D. Blast Furnace Design Problems. II. Fred E. Kling. *Blast Furnace and Steel Plant,* v. 42, Aug. 1954, p. 934-937.

Ways to improve life and operation of stoves, hot blast mains, mixers and ladles. Diagrams. (D1, Fe)

351-D. Survey Provides Analysis of Cold Metal Shop Melting Practice. S. L. Fredericks. *Journal of Metals,* v. 6, Aug. 1954, p. 880-882.

Significance of data obtained on the charging and fluxing practices in cold metal shops. Photographs, tables. (D2, ST)

352-D. Ingot Cracks in Killed, Fine-Grained C1020 Steel. M. A. Orehoski, N. R. Arant and J. A. Pusateri. *Journal of Metals,* v. 6, Aug. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 891-899.

Conditions responsible for cracks during top-pouring practice and corrective measures. Photographs, tables, diagram. 7 ref. (D9, CN)

353-D. Oxygen in Steelmaking. *Metallurgia,* v. 50, no. 297, July 1954, p. 10-12.

Desiliconizing of hot metal; oxygen lancing in the openhearth; use in converter process. Photograph. (D2, D3, ST)

354-D. Methane for Openhearth Fuel. D. W. Gillings. *Metal Progress,* v. 66, Aug. 1954, p. 91-93.

Use of direct combustion and in combination with fuel oil. Substitution for coke oven gas. Use for underfiring coke ovens. Diagrams. (D2, B18)

355-D. Furnace Men Report on Advantages of Induction Stirrer. (Digest of papers presented at the Electric Furnace Steel Conference of the American Institute of Mining and Metallurgical Engineers, Cincinnati, Ohio, Dec. 2 to 4, 1953.) *Metal Progress,* v. 66, Aug. 1954, p. 140, 142-143.

History and operating characteristics of stirrer. (D6)

356-D. The Future of Steelmaking. Possible Development of Counterflow Continuous Process as Substitute for the Open-Hearth. M. W. Thring. *South African Mining and Engineering Journal,* v. 65, pt. 1, July 10, 1954, p. 725, 727, 729, 731.

Review of fuel consumption in openhearth furnaces and recent improvements in furnace efficiency. Characteristics and advantages of continuous furnaces. Tables, graphs. 4 ref. (D2)

357-D. (French.) **Considerations on the Charging of Large Blast Furnaces Designed for Crushed Ore. Star-Shaped Distributing Throat.** M. H. Meynadier. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 8, 1954, p. 1515-1526.

System of charging in which gas can leave the throat without having to pass through the ore falling from the lower bell. Diagrams. (D1, C1)

358-D. (French) **Changes of Slag and Metal Compositions During Pouring.** M. Achard. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 8, 1954, p. 1527-1535.

Development and extent of variations in 58 heats of soft and semisoft chromium-nickel steel. Tables, charts. (D9, AY)

359-D. (French.) **Induction Stirring of Arc-Furnace Bath.** *Journal du Four Electrique,* v. 63, no. 3, May-June 1954, p. 82-83.

Effective for low carbon steels; effects during refining and deslagging; increase of desulfuration and deoxidation speed. (D6, D5, CN)

360-D. (German.) **Exchange of Experiences at the Ministry for the Heavy Industry, Chief Administration of the Iron Industry. Ingot-Surface Defects and Their Causes.** S. Kronmarck. *Metallurgie und Giessereitechnik,* v. 4, no. 6, June 1954, p. 243-250.

Causes, effects and methods of avoiding cracks, nonmetallic inclusions, slag and oxide entrapment, and surface blow holes. Graphs, photographs, tables. 11 ref. (D9, ST)

361-D. (German.) **On the Problem of Reducing Nitrogen Pickup in the Basic Steel Converter.** Reinhold Baake, Hans Eisenreich and Kurt Schröder. *Metallurgie und Giessereitechnik,* v. 4, no. 6, June 1954, p. 253-254.

Experimental data reveal effects of melting time, air-blast pressure, depth of bath, original temperature of charge, casting temperature and age of converter on the nitrogen content of the steel. Graphs. (D3, CN)

362-D. The Electric Smelting of Iron Ore. W. M. Armstrong. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 508, Aug. 1954, p. 517-522; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 315-320.

Design and operation of electric smelters for pig iron production. Diagrams, tables. 14 ref. (D5, CI-a)

363-D. The Chemical Basis of the Manufacture of Iron and Steel. D. J. O. Brandt. *Chemistry & Industry,* 1954, no. 32, Aug. 7, p. 982-987.

Reduction of iron ore, removal of impurities and blast furnace and openhearth reactions. Diagrams, graphs. 2 ref. (D1, D2, Fe)

364-D. Lackenby Open Hearth Steel Works. I. *Engineer,* v. 198, Aug. 6, 1954, p. 190-193 + 2 plates.

Development of post-war program of a British company. Diagrams, photographs. (To be continued.) (D2, ST)

365-D. Gasholders. Special Applications in the Steel Industry. T. H. Riley. *Iron & Steel,* v. 27, Aug. 1954, p. 399-402.

Principles, uses and advantages of water-sealed, waterless, dry-sealed and fabric-sealed holders. Photographs, diagram. (D general)

366-D. Pig Beds. A Method of Machine Moulding. G. S. Milburn. *Iron & Steel,* v. 27, Aug. 1954, p. 409-410.

Handling iron surplus with minimum labor and maximum speed. Photographs, diagram. (D9)

367-D. Simplified Control Curbs Arc Furnace Power Appetites. *Steel,* v. 135, Aug. 23, 1954, p. 108, 111.

Principles of system and effects on production. Diagram. (D5)

368-D. Behavior of Hydrogen in Steel Making, General Discussion. W. Oelsen. *Henry Brutcher, Altadena, Calif., Translation no.* 3236, 12 p. (Abridged from *Stahl und Eisen,* v. 73, no. 13, 1953, p. 825-828.)

General discussion of paper of the same title by E. Piper and others (Brutcher Translation no. 3235) and previously abstracted. See item 277-D, 1953. (D general, S11, ST)

369-D. New Experiences in the Production of Pig Iron in the Electric Low-Shaft Furnace. H. Walde. *Henry Brutcher, Altadena, Calif., Translation no.* 3282, 15 p. (Abridged from *Stahl und Eisen,* v. 73, no. 23, 1953, p. 1441-1446.)

Previously abstracted from original. See item 37-D, 1954. (D1, CI)

370-D. Reducing Action of Hydrogen and Carbon Monoxide Upon Iron Oxides at Low Temperatures. A. N. Kuznetsov. *Henry Brutcher, Altadena, Calif., Translation no.* 3300, 16 p. (From *Zhurnal Fizicheskoi Khimii,* v. 27, no. 12, 1953, p. 1808-1815.)

Reactions during initial stage of reduction at temperatures up to 570° C. Graphs, table. 9 ref. (D8, Fe)

371-D. Refining of Steel in the Tapping Spout Between Furnace and Ladle. W. Küntscher and K. Steinheisser. *Henry Brutcher, Altadena, Calif., Translation no.* 3322, 11 p. (From *Metallurgie und Giessereitechnik,* v. 1, no. 2, 1951, p. 40-43.)

Details of the covered Steinheisser tapping spout for openhearth furnaces. Comparison of mechanical properties with steels produced by ordinary tapping methods. Tables, diagrams. 1 ref. (D9, D2, Q general, CN)

372-D. Lining of a 900-Ton Hot Metal Mixer With Dolomite Brick. K. Mayer, F. Gareis, S. Kienow, H. Knüppel and G. Trömel. *Henry Brutcher, Altadena, Calif., Translation no.* 3327, 12 p. (Condensed from *Stahl und Eisen,* v. 73, no. 23, 1953, p. 1457-1462.)

Previously abstracted from original. See item 40-D, 1954. (D1)

373-D. (French.) **Interfacial Tension Between Slag and Cast and Desulfurization Mechanism.** Paul Kozakevitch, Georges Urbain and Max Sage. *Comptes rendus,* v. 239, no. 2, July 12, 1954, p. 166-168.

Suggests that coalescence of sulfur droplets, brought about by increase of tension, influences rate of desulfurization in the blast furnace. Diagrams. 3 ref. (D1, P10, CI)

374-D. (German.) **The Oxidation of Molten Ferrous Sulfide. The Processes in the Bessemerizing of Ore.** Ernst Justus Kohlmeyer and Klaus Geissler. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 7, July 1954, p. 281-283.

Reaction of an iron sulfide melt with a surface blast of oxygen. Formation of ferrous, ferric and sulfur oxides. Tables, graphs. 2 ref. (D3)

375-D. Lackenby Open Hearth Steel Works. II. *Engineer,* v. 198, Aug. 13, 1954, p. 223-225.

Melting shop and other buildings and equipment. Photographs. (D2, A5, ST)

376-D. Removal of Copper From Iron-Copper-Carbon Alloys. F. C. Langenberg and R. W. Lindsay. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 967-968.

Preliminary results of tests using lead and sodium sulfide to remove residual copper from steel. Tables, 6 ref. (D general, P12, Cu, ST)

377-D. New Dorman Long Steelworks. First Plant in Operation on Lackenby Site. *Metallurgia,* v. 50, no. 298, Aug. 1954, p. 55-62.

Design, equipment and practice in new steel mill integrated with two old plants. Photographs. (D general, ST)

378-D. Industrial Waste Guide—Blast Furnace Department of the Steel Industry. Hayse H. Black and Gerald N. Mcdermott. *Sewage and Industrial Wastes,* v. 26, Aug. 1954, p. 976-990.

Blast furnace gas cleaning. Volume, character and treatment of liquid wastes. Tables, diagram. 18 ref. (D1, A8)

379-D. (German.) **The Waste-Gas Conditions in the Basic Bessemer Steel Plant When Using Blasts of Different Composition.** Hans Kosmider, Herbert Neuhaus and Hermann Kratzenstein. *Stahl und Eisen,* v. 74, no. 17, Aug. 12, 1954, p. 1045-1053; disc., p. 1053-1054.

Effect of type of blast, namely ordinary air, oxygen-enriched air and oxygen-water vapor mixture, on heat loss, dust content and iron loss in flue gases. Diagrams, graphs, table, micrographs. 8 ref. (D3, A8)

380-D. (Italian.) **Operating Data of Top-Charging Electric Furnaces Recently Installed in the Sisma, Terni, Fiat, Siac, and Dalmine Steelworks.** P. Milanesi, G. Castagnola, G. D. Leo, P. Allarme and M. Bevilacqua. *Metallurgia italiana,* v. 46, no. 6, June 1954; *Atti notizie* (AIM), v. 9, no. 6, June 1954, p. 175-182; disc., p. 183-185.

Equipment and experience of various firms. Tables, graphs. (D5, ST)

381-D. Open-Hearth Versus Electric-Furnace Economics and Their Significance to the Power Industry. David D. Moore. *American Power Conference, Proceedings,* v. 16, 1954, p. 375-385.

Factors affecting relative costs of bath operations and importance of growth in production of electric furnace steels to the power industry. Tables, graphs. 6 ref. (D2, D5, A4)

382-D. Metallurgy and Practice of the Basic Converter Processes. A. Weyel and H. Kosmider. *Blast Furnace and Steel Plant,* v. 42, Sept. 1954, p. 1039-1047, 1065.

Principles and modern developments of basic bessemer process. Graphs, tables, diagrams. (To be continued.) (D3, CN)

383-D. Oxidation and Its Relationship to Steel Making. I. C. F. Christopher. *Blast Furnace and Steel Plant,* v. 42, Sept. 1954, p. 1059-1065.

Sources, role and control of oxygen in various stages of steelmaking. Table, graphs, diagrams. (To be continued.) (D general, ST)

384-D. Production Vacuum Melting—A Step Forward. Harry E. Trout. *Blast Furnace and Steel Plant,* v. 42, Sept. 1954, p. 1066-1068.

Equipment for production of special quality steels on small commercial scale. Diagram, photographs. (D8 ST)

385-D. Electric Steel Production. IV. Technological Developments. D. D. Howat. *Iron & Steel,* v. 27, Sept. 1954, p. 446-450.

Major advances in electric arc melting techniques. 42 ref. (D5, ST)

386-D. Improved Cleaning Techniques for Open Hearth Checkers. J. J. Enochs and Reece Kincaid. *Iron and Steel Engineer,* v. 31, Aug. 1954, p. 79-82; disc., p. 82-83.

Advantages in use of high-pressure stream of chemical solvent jetted against hot deposit. Photographs, diagrams. (D2)

387-D. Transformers for the Steel Industry. *Iron and Steel Engineer*, v. 31, Aug. 1954, p. 118-135.

Includes "Transformer Materials", D. C. Graham and L. R. Bronlund; "The Application of Transformers in the Steel Industry", L. G. Levoy; and "Power Transformer Preventive Maintenance in the Steel Industry". E. A. Elge. (D general)

388-D. The Electric Ingot Process. *Iron and Steel Engineer*, v. 31, Aug. 1954, p. 154, 157.

Outline of a continuous melting and casting process. Photographs, diagram. (D9, ST)

389-D. Sulphur in Silicate and Aluminate Slags. F. D. Richardson and C. J. B. Fincham. *Iron and Steel Institute, Journal*, v. 178, Sept. 1954, p. 4-15.

Study on partition of sulfur in gases and slag for various operating conditions and slag compositions in blast furnace and openhearth. Tables, graphs. 31 ref.
(D1, D2, B21, ST)

390-D. Linings for Induction Furnaces. H. E. White. *Meal Progress*, v. 66, Sept. 1954, p. 99-106.

Magnesia-alumina mixes and zircon are favored for special steels and high alloys. Do's and don'ts for the melting superintendent. Properties of the minerals and the refractory and manufacuring processes. (D6, AY)

391-D. Blast Furnace Exploration. Use of a Continuous Flow Counter. T. W. Johnson and D. Meachen. *Research*, v. 7, Sept. 1954, p. 356-359.

Measurement of transit time of gases through a furnace burden. Graphs, diagrams. 2 ref. (D1)

392-D. (German.) **The Metallurgy of the Blast Furnace.** Theo Kootz, Alfred Michel, and Heinrich Rellermeyer. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 7-8, July-Aug. 1954, p. 299-306.

Factors effecting arc reduction, silicon and manganese reaction, effect of carbon content, computation of saturation points of carbon in iron and equilibria beween pig iron and slag with solid carbon. Graphs, table. 25 ref. (D1, CI)

393-D. (German.) **The Iron-Sulfur-Oxgen System and Its Importance as a Basis for the Reactions of Iron Sulfides With Sulfur Dioxide to Form Iron Oxides and Sulfur Vapor.** Norbert G. Schmahl. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 7-8, July-Aug. 1954, p. 315-319.

Studies of equilibria to determine possible reactions and new graphic process of treating such ternary systems. Graphs, tables.
(D general, P12, ST)

394-D. (Russian.) **Analytical Method of Calculating Asymmetrical Conditions of Three-Phase Electric Arc Furnaces.** N. A. Markov. *Elektrichestvo*, 1954, no. 8, Aug., p. 47-51.

Includes graphs. 3 ref. (D5)

395-D. Promising Blast Furnace Supplements. Arthur J. Stone. *Battelle Technical Review*, v. 3, Oct. 1954, p. 105-108.

Prospective shortages in high-quality coke and iron ore can be alleviated with new equipment or processes developed to smelt either low-grade ores or high-grade concentrates with low-grade fuels. Electric low-shaft furnaces described and effects of using enriched blast and prepared charges evaluated. Diagrams. (D1)

396-D. Possibilities of Reducing the Phosphorus Content of Cast Iron. R. I. Higgins. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Aug. 1954, p. 390-413.

Reactions of phosphorus in blast furnace; dephosphorization in the cupola and blast furnace; methods for increasing silicon and manganese contents of iron-carbon alloys. Tables, graphs, micrographs, diagrams. 29 ref. (D1, E10, CI)

397-D. New Iron Industry in South Africa. W. Williams. *Chemical & Process Engineering*, v. 35, Sept. 1954, p. 285.

Based on Krupp-Renn process for low-grade ores. (D8, Fe)

398-D. Details of Timken Induction Stirrer. Quentin Graham. *Electric Furnace Steel Proceedings*, v. 11, 1953, p. 22-23.

Description of magnetic core, winding, cooling and power supply. (D6)

399-D. Rotating Magnetic Stirrer for the Arc Furnace. E. H. Browning and M. F. Jones. *Electric Furnace Steel Proceedings*, v. 11, 1953, p. 23-29.

Design of experimental holding ladle and stirrer, results of experimental tests and cause of stirring motion. Photographs, diagrams, graphs. (D5)

400-D. Development of Induction Stirring. Eric G. Malmlow. *Electric Furnace Steel Proceedings*, v. 11, 1953, p. 11-22; disc., p. 29-33.

Principles, equipment and applications. Photographs, diagrams, graphs. 18 ref. (D6)

401-D. Deoxidation and Its Effects on the Physical Properties of Steel. C. F. Christopher. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 101-115; disc., p. 115-120.

Good deoxidation, inclusions, furnace operation and critical oxygen level. Graphs, table. 4 ref. (D2, P12, ST)

402-D. Sulphide and Oxide Formation in Steel. Walter Crafts and D. C. Hilty. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 121-145; disc., p. 145-150.

Mechanism of inclusion formation and its application to a rationalization of some of the anomalies observed in practice. Graphs, micrographs. 31 ref. (D9, ST)

403-D. New Developments and Trends in Design and Operation of Electric Furnaces. W. E. Lewis. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 164-174.

Mechanical improvements, electrical advances, developments in electric counterbalancing, statistics and predictions. Photographs, graphs. (D5)

404-D. New Developments in Electric-Arc Furnace Design and Operation. Charles W. Vokac. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 174-178.

Principle, advantages and uses of the Whiting control. Diagram. (D5)

405-D. Developments in Arc Furnace Design and Operation. E. A. Hanff. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 178-180; disc., p. 180.

Electrical equipment, working conditions, safety and production line. (D5)

406-D. Design, Operation, and Maintenance of Modern Large High-Powered Electric-Arc Furnaces. George D. Lawrence. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 187-192; disc., p. 193, 312.

Problems and possible solutions associated with electric steelmaking process and its demands for design of larger, more complex, and higher powered furnaces. (D5)

407-D. Solidification of Steel in Ingot Molds. L. H. Nelson. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 226-241; disc., p. 241-243.

Mechanism of and relation between transverse and vertical solidification, solidification curves, calculation of time of solidification and K-value of transverse solidification from mold data. Tables, graphs. 9 ref. (D9, N12, ST)

408-D. Nitrogen in Stainless Steel. H. P. Rassbach, E. R. Saunders and W. L. Harbrecht. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 244-256; disc., p. 256-268.

Behavior of nitrogen in melting process for stainless steels and its bearing on improved production of nitrogen steels. Graphs, tables. 13 ref. (D5, SS)

409-D. Inclusions in Steel From Pouring Refractories. D. J. Carney and E. C. Rudolphy. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 274-281.

Similarity of large inclusions to refractories, nozzle and well erosion and recommendations for minimizing source of inclusions from pouring refractories. Micrographs, tables. 4 ref. (D9, ST)

410-D. Sulphur Control in Electric Furnace Steelmaking. B. R. Queneau and C. V. Klimas. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 281-289; disc., 289-299.

Effects of carbon content, lime addition, time under reducing slag and total sulfur in system. Method of calculating slag weights required for reducing sulfur in bath. Graphs, tables. 5 ref. (D5, ST)

411-D. Chemistry of Acid Electric Steelmaking. N. F. Dufty. *Foundry,* v. 82, Oct. 1954, p. 120-125, 260-263.

Slag systems, slag metal reactions, carbon oxidation, iron oxide control and special slags. Graphs, tables. 17 ref. (D5, ST)

412-D. Acid Open Hearth Furnace Bottoms. I. *Industrial Heating,* v. 21, Sept. 1954, p. 1770, 1772, 1776, 1778.

Installation, maintenance and care. (To be continued.) (D2, ST)

413-D. New Techniques for Furnace Scanning. *Mechanical World and Engineering Record,* v. 134, Sept. 1954, p. 421.

Visual, photographic and cinematographic examination of interiors of openhearth and blast furnaces are valuable tools for steel research. (D1, D2, ST)

414-D. Mechanism of Reduction of Iron Oxides With Hydrogen, Carbon Monoxide, and Mixtures of These Gases. V. A. Roiter, V. A. Yuza and A. N. Kuznetsov. *Henry Brutcher, Altadena, Calif., Translation no.* 3313, 18 p. (From *Zhurnal Fizicheskoi Khimii,* v. 25, no. 8, 1951, p. 960-970.)

Investigation into processes of reduction of chemically pure ferric oxide with hydrogen, carbon monoxide and mixtures thereof, at temperatures as low as possible so as to eliminate the influence of macro-

factors. Graphs, diagrams. 13 ref. (D general, Fe)

415-D. (French.) **Characteristics of German Openhearth Furnaces.** K. Guthmann. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 9, 1954, p. 1575-1621. (Extracts from the "Confidential Report of the V.D.E." on studies carried out between 1939 and 1945, Verlag Stahleisen, Dusseldorf, 1953, p. 319-356.)

Analyzes answers to questionnaire sent in 1943 to all openhearth plants in Germany, Poland and Bohemia-Moravia regarding production characteristics, fuel consumption and refractory life. Tables, graphs. 26 ref. (D2, ST)

416-D. (French.) **Mechanization in Iron Mines. Its Influence on the Operating of Blast Furnaces and Production Costs for Pig Iron.** M. Gerin. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 9, 1954, p. 1689-1693; disc., p. 1673-1674.

Influence of mechanization of loading in mines on winning methods and on pig iron production costs. Tables. (D1, B12, Fe)

417-D. (French.) **The Viscosity of Blast Furnace Slags.** Paul Kozakevitch. *Revue de métallurgie,* v. 51, no. 8, Aug. 1954, p. 569-587.

Viscometer with coaxial cylinders makes it possible to establish temperature at which crystallization begins by making measurements at temperature intervals. Tables, graphs. 26 ref. (D1, B21)

418-D. (Book.) **Electric Furnace Steel Proceedings,** v. 11, 1953, 322 p. American Institute of Mining and Metallurgical Engineers, 29 W. 39th St., New York 18, N. Y.

Collection of 29 papers covering induction stirring in arc furnaces, jet engine steels and related operating problems, inclusions in steel, mechanical aspects of electric furnace operators, modern high-powered arc furnace, and ingot metallurgy. Papers are individually abstracted. (D5, ST)

419-D. **Desulphurizing With Solid Lime.** Sven Eketorp. *Blast Furnace and Steel Plant,* v. 42, Oct. 1954, p. 1159-1161, 1177.

Treatment of pig iron in rotating furnace with finely ground burnt lime reduces sulfur content to 0.001%. 6 ref. (D1, Fe)

420-D. **Improved Process Control Assures Economical Production of Extra Low Carbon Cast Stainless.** R. W. de Weese. *Iron Age,* v. 174, Oct. 14, 1954, p. 133-135.

Practices used in arc and induction furnaces. Photographs, tables. (D5, D6, SS)

421-D. **Measurement and Influence of Preheat in the Open-Hearth Furnace.** W. P. Cashmore. *Iron and Steel Institute, Journal,* v. 178, Oct. 1954, p. 112-121.

Apparatus and experimental technique to determine effects of amount of preheat in various types of open-hearth and under various operating conditions. Graphs, diagram. 5 ref. (D2, ST)

422-D. **Radioactive Measurement of Valve Leakage, Infiltration, and Blow-out in Open-Hearth Furnaces.** E. B. Bell and D. Thomas. *Iron and Steel Institute, Journal,* v. 178, Oct. 1954, p. 122-126.

Use of radon to determine operating efficiency. Diagrams, graphs. 3 ref. (D2)

423-D. **Investigations on Taphole Clays and Taphole Practice.** W. Banks and H. M. Richardson. *Iron and Steel Institute, Journal,* v. 178, Oct. 1954, p. 138-146.

Properties of 12 commercial clays. Effects of compounding and blast furnace practice on behavior. Tables, graphs, diagram. (D1)

424-D. **Slag-Metal-Graphite Reactions and the Activity of Silica in Lime-Alumina-Silica Slags.** James C. Fulton and John Chipman. *Journal of Metals,* v. 6, Oct. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Oct. 1954, p. 1136-1146.

Experimental data on reduction of silicon from blast furnace-type slags by carbon-saturated iron; determination of conditions for formation of silicon carbide. Graphs, tables. 18 ref. (D1, P12, ST)

425-D. **Joint Pouring of Basic Bessemer and Electric Furnace Steel.** E. Ritter: *Henry Brutcher, Altadena, Calif., Translation no.* 3347, 14 p. (From *Stahl und Eisen,* v. 69, no. 8, 1949, p. 258-262.)

Previously abstracted from original. See item 2B-185, 1949. (D3, D5, ST)

426-D. (German.) **Appearance of Surface Blisters in Bottle-Shaped Ingots Used in the Production of Wheel Tires.** Arthur Schubert, Georg Wycisk and Helmut Scholte. *Metallurgie und Giessereitechnik,* v. 4, no. 8, Aug. 1954, p. 372-374, 356-358.

Chemical analyses, mechanical tests, metallographic investigations and re-examination of melting and casting process to determine cause

of defects. Graph, photographs, micrographs. (D9, CN)

427-D. (German.) **The Evolution of the Basic Bessemer Steel Production in Europe and the Design of Basic Converter Steel Plants.** Hermann Brandi. *Stahl und Eisen,* v. 74, no. 20, Sept. 23, 1954, p. 1262-1267.

History and principles of modern practice. Diagrams, graphs, photographs. 2 ref. (D3, CN)

428-D. (German.) **New Findings and Contributions to the Metallurgy of the Basic Bessemer Process.** Hans Kosmider and Hermann Schenck. *Stahl und Eisen,* v. 74, no. 20, Sept. 23, 1954, p. 1281-1292.

Recent developments and improvements. Graphs. 8 ref. (D3, CN)

429-D. (German.) **Susceptibility of Free Machining Rimming Basic Bessemer Steel to Defects.** Helmut Knüppel and Karl Ernst Mayer. *Stahl und Eisen,* v. 74, no. 20, Sept. 23, 1954, p. 1292-1299.

Effects of oxygen, manganese, phosphorus, sulfur, nitrogen, slag and production variables. Graphs, tables. (D3, CN)

430-D. **Non-Metallic Inclusions. I. Deoxidation Products.** H. B. Bell. *Iron & Steel,* v. 27, Oct. 1954, p. 493-499.

Reactions induced by manganese, silicon, aluminum, vanadium, titanium, chromium, boron and zirconium during deoxidation of steel. Graph. 48 ref. (To be continued.) (D general, ST)

431-D. **Studies in Reduction of Powdered Haematite. I. Batch Reduction. II. Continuous Reduction in a Rotary Kiln.** R. M. Khandwala and G. S. Tendolkar. *Journal of Scientific & Industrial Research,* v. 13, sec. B, Aug. 1954, p. 561-571.

Includes graphs, tables, diagram. 29 ref. (D8, Fe)

432-D. (French.) **Principal Results of the Enquiry on Ingot Molds in French Basic Bessemer Steel Plants.** Jean Duflot. *Fonderie,* 1954, no. 103, Aug., p. 4078-4090.

Investigation in 19 steel plants and 18 foundries on design, preparation and use of ingot molds. 12 ref. Tables, drawings, charts. (D3, D9, ST, CI)

433-D. (French.) **Notes on the Solidification and Effervescence of Basic Bessemer Steel Ingots Weighing 4.6 Tons.** J. Duflot and A. Richard. *Revue de métallurgie,* v. 51, no. 9, Sept. 1954, p. 623-655; disc., p. 655-657.

Effects of pouring rate, mold weight and composition of gases on solidification and surface quality. Diagrams, tables, graphs, photograph. 33 ref. (D9, D3, CN)

434-D. (Italian.) **Flame Radiation Power in Industrial Furnaces.** Francesco Savioli. *Metallurgia italiana,* v. 46, nos. 7-8, July-Aug. 1954; *Atti notizie (AIM),* v. 9, nos. 7-8, July-Aug. 1954, p. 215-225.

Thermokinetics and combustion mechanisms. Possible applications to openhearth furnaces. Diagrams, charts, table. 122 ref. (D2)

435-D. **The Chemical Behavior of Silicon in the Iron Blast Furnace.** James C. Fulton. *American Iron and Steel Institute, Preprint,* 1954, 14 p.

Reactions involving sulfur and silicon under various operating conditions. Graphs, table, diagrams. 20 ref. (D1, CI)

436-D. **The Application of Thermodynamics to the Control of the Iron Blast Furnace.** K. T. Goodchild. *Birmingham Metallurgical Society, Journal,* v. 34, Sept. 1954, p. 87-111.

Free energy change data explain reactions and conditions for their control. Diagrams, tables, graphs. 5 ref. (D1, P12, CI)

437-D. **Properties of Burned-In Basic Open-Hearth Bottoms.** A. S. Berezhnoi. *Henry Brutcher, Altadena, Calif., Translation no.* 2467, 16 p. (From *Stal,* v. 8, no. 1, 1948, p. 28-36.)

Chemical and phase composition and other characteristics, advantages of use of magnesite alone, stresses, contamination effects. Table, graphs, micrographs. 6 ref. (D2)

438-D. **Rammed Ports and Front Walls in Open-Hearth Furnaces.** V. N. Litvishko. *Henry Brutcher, Altadena, Calif., Translation no.* 2794, 3 p. (From *Stal,* v. 6, nos. 11-12, 1946, p. 697.)

Advantages, data on composition, preparation and application of ramming mix, ramming practice. Performance of furnaces with partly rammed linings. (D2)

439-D. **Trial Production of Low-Nitrogen Steels in Basic-Lined Baby Converter.** K. G. Speith and H. Bücken. *Henry Brutcher, Altadena, Calif., Translation no.* 2997, 18 p. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 9-10, 1952, p. 325-333.)

Previously abstracted from original. See item 391-D, 1952. (D3, ST)

440-D. **Problems of Pig Iron Production in the Low-Shaft Furnace.** K. Säuberlich and R. Baake. *Henry*

Brutcher, Altadena, Calif., Translation no. 3280, 13 p. (From *Metallurgie und Giessereitechnik,* v. 4, no. 2, 1954, p. 55-60.)

Previously abstracted from original. See item 185-D, 1954. (D8, CI)

441-D. Processing of Titaniferous Magnetites Based on Reduction of Ores With a Gaseous Reducing Agent at Moderate Temperatures. E. V. Snopova and N. I. Rotkov. *Henry Brutcher, Altadena, Calif., Translation no.* 3298, 20 p. (From *Trudy Uralgeomin (Uralsk. Nauch-Issled. Instituta Geologii, Razvedoki Issledovaniya Mineral'nogo Syr'ya),* 1938, no. 3, p. 285-293.)

Production of sponge iron by melting in high-frequency furnaces, and extraction of titanium and vanadium from the slag by chemical methods. Direct production of iron from ilmenite by action of hydrogen and carbon monoxide at moderate temperatures. Tables, 2 ref. (D8)

442-D. Contribution to the Study of the Metallurgy of Top Blowing. I. H. Rellermeyer and T. Kootz. *Henry Brutcher, Altadena, Calif., Translation no.* 3324, 20 p. (Abridged from *Stahl und Eisen,* v. 74, no. 7, 1954, p. 381-390.)

Previously abstracted from original. See item 187-D, 1954. (D3, ST)

443-D. (French.) **Contribution to the Study of the Role of Manganese in Refining in the Basic Bessemer Converter.** M. Cassier, P. Leroy and J. Stremsdoerfer. *Institut de Recherches de la Sidérurgie, Publications,* ser. A, no. 77, Sept. 1954, 36 p.

Preparation, correlations between composition of charge, preparation conditions and chemical characteristics of metal, ingot casting, rolling characteristics. Tables, graphs, charts. 17 ref. (D3, CN)

444-D. (French.) **Checking the Basic Bessemer Conversion by the Brightness of the Flame. Application to the Conversion by the Oxygen-Water Vapor Mixture.** J. Daubersy, *Revue universelle des mines,* v. 10, ser. 9, no. 10, Oct. 1954, p. 642-654.

Use of photo-electric cells for continuous measuring of brightness. Graphs. (D3, ST)

445-D. (Book.) **Metallurgical Progress.** John Taylor, P. T. Carter, and T. B. King. 80 p. 1954. Louis Cassier Co. Ltd., Dorset House, Stamford St., London, S.E.1, England. 3s., 4½d.

Reprints of "Critical Reviews" from *Iron and Steel,* covering ironmaking, steelmaking reactions, and solidification of steel.
(D general, ST)

SECTION E

FOUNDRY

1-E. Quantity Production of Malleable Castings. H. Hayden. *Foundry Trade Journal,* v. 95, Oct. 22, 1953, p. 499-503; disc., p. 503-504.

Design, developments and controls, all of which have considerable influence on increasing production and reducing waste. Photographs. (E11, CI)

2-E. The Fluidity of Molten Steel. B. G. Rightmire and H. F. Taylor. *Iron and Steel Institute, Journal,* v. 175, Oct. 1953, p. 167-176.

Quantitative evaluation of fluid flow based on published experimental data and established hydrodynamic theory. Diagrams, tables, graphs. 25 ref. (E23, CI)

3-E. Melting Practice for Investment Casting. II. Sam Tour. *Precision Metal Molding,* v. 11, Nov. 1953, p. 40-41, 83-87.

Melting contamination and losses, refractories and crucibles. Photographs (E15)

4-E. Eight Facts to Consider in Specifying Castings. E. O. Mildebrath. *Precision Metal Molding,* v. 11, Nov. 1953, p. 47, 93-94.

Costs of tooling, rough casting, machining, jigs and fixtures and preparation of surface for finishing. Photographs, table. (E general)

5-E. Mechanization Takes Over Sand Molding. Leon F. Miller. *Steel,* v. 133, Nov. 9, 1953, p. 116.

Automatic molder capable of producing cylinder block halves at rate of 240 per hr. and shallower molds at 300 per hr. Photograph. (E19)

6-E. Flame-Set Spray Resin for Foundries. *Adhesives & Resins,* v. 1, Oct. 1953, p. 231-232.

Solutions of Catalac resin are sprayed on the surface of green sand molds and dried very rapidly to produce a hard finish. Photographs. (E19)

7-E. Oxidized Iron. W. J. Williams. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Oct. 1953, p. 41-44 + 1 plate.

The oxygen content of a number of taps from each of two melts was deliberately increased and chill test pieces were cast from each tap. No appreciable influence on chilling characteristics that could be attributed to the treatment of the metal and the subsequent changes in oxygen content was detected. Photographs, tables. (E25, CI)

8-E. Gas Analyses of Cast Iron Produced at Various Foundries. B. B. Bach. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Oct. 1953, p. 45-70 + 1 plate.

Samples of cast iron and pig iron were taken at 12 industrial plants and the oxygen, hydrogen and nitrogen contents determined. Results were tabulated, together with other relevant data such as melting temperature, type of furnace, etc. Tentative conclusions. Photographs, diagrams, tables. (E general, S11, CI)

9-E. Extensions at Millspaugh. *Foundry Trade Journal,* v. 95, Oct. 29, 1953, p. 525-529.

Centrifugal foundry equipment, plant layout and operating procedures. Brief history of the concern. Diagrams, photographs. (E14)

10-E. Shell-Moulding Process. D. N. Buttrey. *Foundry Trade Journal,* v. 95, Oct. 29, 1953, p. 531-536.

Present position of process and techniques available for making shell molds. Tables. 13 ref. (E16)

11-E. Flow Properties of Foundry Sand. J. Gittus. *Iron & Steel,* v. 26, Nov. 1953, p. 501-506.

Various tests for foundry sands and results of these tests for evidence of flowability evaluation.

Graphs, photographs, diagrams. 7 ref. (To be concluded.) (E18)

12-E. Composition Control of Steel Castings Improved by New Furnace Sampling Methods. Vincent E. Belusko. *Journal of Metals,* v. 5, Nov. 1953, p. 1430-1432.

New sampling methods permit greater economic and production advantages. Photographs. (E25, S12, CI)

13-E. Moulding Sands for Piston Ring Castings. R. M. Krishman, M. N. Khanna and B. R. Nijhawan. *Journal of Scientific & Industrial Research,* v. 12, sec. A, Sept. 1953, p. 417-421.

Properties of foundry sands from Great Britain were determined and compared with properties of Indian sands. Graphs, micrographs, tables. (E18)

14-E. Casting Torque Converter Parts With Plaster Cores. Charles H. Wick. *Machinery,* v. 60, Nov. 1953, p. 166-171.

Forming of cores; preparation of molds; and pouring, cleaning and testing of castings. Photographs. (E16, Al)

15-E. Shell-Mold Casting of Automotive Parts. James H. Smith. *Machinery,* v. 60, Nov. 1953, p. 186-195.

Equipment and operating procedures at General Motors' foundries. Photographs. (E16)

16-E. Slush Casting of Light Alloys. *Machinery (London),* v. 83, Oct. 30, 1953, p. 872-873.

Equipment and methods. Photographs. (E16, Al, EG-a)

17-E. Investment Precision Casting. A. Dunlop. *Metal Industry,* v. 38, Oct. 30, 1953, p. 355-357.

Process in which accurate molds are produced directly from suitable master patterns. Complications associated with wax molding dies and wax injection equipment are avoided and dimensional errors arising from wax shrinkage and distortion eliminated. Photographs. (To be continued.) (E15)

18-E. Metal Casting Methods. VII. Moulding Sands and Pattern Production. J. B. McIntyre. *Metallurgia,* v. 48, no. 288, Oct. 1953, p. 165-168.

Molding sands and their properties. Sand-cement molding technique; patterns and their production. Photographs. (E18, E17)

19-E. Non-Ferrous Centrifugal Foundry. *Engineer,* v. 196, Nov. 6, 1953, p. 589.

Equipment, plant layout and operating procedures in foundry designed to produce very large castings. Photographs. (E14, EG-a)

20-E. Designing an Iron Foundry. Donald Appleyard and Stephen Rosenberg. *Foundry,* v. 95, Nov. 19, 1953, p. 619-621.

How authors set about this project; results of their deliberations. Diagrams, photograph. (E general)

21-E. Investment Precision Casting. A. Dunlop. *Metal Industry,* v. 83, Nov. 6, 1953, p. 381-382.

Mold making and treatment of castings. Photographs. (E15)

22-E. Centrifugal Casting Solves Non-Magnetic Flywheel Problem. R. J. Severson. *Steel,* v. 133, Nov. 23, 1953, p. 120.

Melt weight of 6300 lb. of aluminum bronze was poured into mold spinning at several hundred rpm. After finish machining, only ounces of metal were removed to meet specifications. (E14, Cu)

23-E. (German.) **Reactions on the Surface of the Mold.** K. Roesch. *Giesserei,* v. 40, no. 22, Oct. 29, 1953, p. 581-585.

Importance of good gas permeability and low liberation of gas. Photographs, table, graphs, micrographs. (E25)

24-E. Gating to Control Pouring Rate and Its Effect on the Casting. F. J. McDonald. *American Foundryman,* v. 24, Dec. 1953, p. 36-41.

Studies of effect of pouring rate on quality of cast iron castings. Diagrams, photographs, tables. (E23, CI)

25-E. Catalytic Combustion Control in Core-Baking Oven. R. J. Ruff. *American Foundryman,* v. 24, Dec. 1953, p. 42-44.

Catalytic element and its use in flameless low-temperature burning of oil vapors. Graphs, photographs. (E21)

26-E. Factors Influencing Riser Range and Feeding Adequacy. II. William S. Pellini. *American Foundryman,* v. 24, Dec. 1953, p. 62-71.

Summarizes studies on solidification of castings and riser action. Graphs, diagrams. 19 ref. (E23, E25, CI)

27-E. Foundry Practice. V. Moulding and Coremaking. William H. Salmon and Eric N. Simons. *Edgar Allen News,* v. 32, Nov. 1953, p. 255-256.

Mold-making machines. Diagrams. (To be continued.) (E19)

28-E. How to Avoid Trouble in the Aluminum Foundry. Donald L. La-

Velle. *Foundry,* v. 81, Dec. 1953, p. 102-106, 259-267.
Cause and prevention of defects due to molding and pouring practices. Photographs. (E19, E23, Al)

29-E. How Temperature and Pouring Rate Effect Solidification of Bronze. Harold J. Roast. *Foundry,* v. 81, Dec. 1953, p. 107.
Methods of avoiding porosity in castings. (E25, Cu)

30-E. Use of Shell Cores in Casting Air-Cooled Engines. John L. Schmieder. *Foundry,* v. 81, Dec. 1953, p. 114-117.
Fabrication of hollow cores. Photographs. (E21)

31-E. Patternmaking for the Repetition Foundry. Robert R. Shaw. *Foundry Trade Journal,* v. 95, Nov. 26, 1953, p. 645-649.
Condensed text of paper presented before meeting of Institute of British Foundrymen. Various techniques necessary for different types of casting. Diagrams, photographs. (E17)

32-E. Simplified Moulding. "Jacques". *Foundry Trade Journal,* v. 95, Nov. 26, 1953, p. 661-664.
Advantages obtained from close cooperation of design department and molding shop. Diagrams. (E19)

33-E. The Oxidation of Aluminium-Magnesium Alloys by Steam: a Contribution of Research on Mould Reaction. Marjorie Whitaker. **The Constitution of Oxide Films Formed at High Temperature on Aluminium-Magnesium-Beryllium Alloys.** A. R. Heath. *Institute of Metals, Journal,* v. 82, Nov. 1953, p. 107-116.
Research on methods of preventing the reaction between aluminum-10% magnesium alloy and steam atmosphere generated in a sand mold. Graphs, tables. 15 ref. (E19, Al, Mg)

34-E. Flow Properties of Foundry Sand. J. Gittus. *Iron & Steel,* v. 26, Dec. 1953, p. 551-553.
Effect of flow properties on mold fabrication. Interprets common terminology in terms of bond energy ratio. Photographs. 13 ref. (E18)

35-E. Electric Steel Foundries Control Dust Emissions in Los Angeles Area. O. E. Erickson. *Journal of Metals,* v. 5, Dec. 1953, p. 1625-1626.
Various types of dust collectors. Tube-type bag filter using Orlon bags has been most successful. Table. (E general, A8, CI)

36-E. Copper Castings. J. B. McIntyre. *Machinery,* v. 83, Nov. 13, 1953, p. 959-962.
Melting equipment, deoxidants and pouring procedures. Graphs. (E general, Cu)

37-E. Quality in Light Metal Castings. *Machinery Lloyd (Overseas Ed.),* v. 25, Nov. 21, 1953, p. 115-116.
Dangers of lowering standards of quality and service in an attempt to fill increasing orders. (E general, EG-a)

38-E. Oblique Withdrawal and Ejection From Die Casting Dies. L. C. Barton and E. N. Field. *Machinery (London),* v. 83, Nov. 27, 1953, p. 1061-1068.
Factors affecting design of tool; advantages, limitations and applications of technique. (E13)

39-E. Shell Moulds for Magnesium Castings. *Machinery (London),* v. 83, Nov. 27, 1953, p. 1069-1070.
Techniques employed and problems encountered in process. (E16, Mg)

40-E. Centrifugal Casting. New Foundry for Millspaugh Limited at Sheffield. *Metal Industry,* v. 83, Nov. 13, 1953, p. 397-399.
Equipment and plant layout. Photographs. (E14)

41-E. Gunmetal Pressure Test Failures. *Metal Industry,* v. 83, Nov. 20, 1953, p. 420.
Porosity defects in gunmetal castings and corrective measures. Photographs. (E25, Cu)

42-E. Metal Casting Methods. VIII. Gating and Feeding Practice. J. B. McIntyre. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 241-246.
Gating and feeding of sand casting and use of chills. Brief reference to jobbing and mechanized molding. Photographs, diagrams. (E22, E23)

43-E. Magnesium Jet Engine Castings Made Pressure-Tight by Vacuum Impregnation. *Modern Metals,* v. 9, Nov. 1953, p. 50.
Impregnation with a thermosetting resin. Photograph. (E25, Mg)

44-E. (French.) **Lubrication and Casting of Tools in Pressure Casting.** R. Grunberg. *Métallurgie et la construction mecanique,* v. 85, no. 11, Nov. 1953, p. 869, 871-872.
Qualities of an ideal lubricant to assure both protection of the surface of the cavity and good lubrication of the moving die components. Properties of silicones. Application of lubricants on the mold. Photographs. (E13)

45-E. All-Electric Operation Features Modern Permanent Magnet Foundry. Robert H. Herrmann. *Foundry,* v. 82, Jan. 1954, p. 86-91, 206, 208, 210, 212.
Equipment, plant layout and operating procedures. Diagram, photographs, tables. (E general)

46-E. Sand Castings Can Be Made to Close Tolerances. Lewis B. Reed. *Foundry,* v. 82, Jan. 1954, p. 92-97, 235-236.

Production of intricate aluminum and magnesium parts with high degree of dimensional accuracy. Photographs. (E19, Al, Mg)

47-E. Several Factors Influence Linear Shrinkage. Hubert Chappie. *Foundry,* v. 82, Jan. 1954, p. 100-103.

How various factors prevent establishment of fixed rule to cover shrinkage of other than small light parts. Photographs. (E25, P10)

48-E. Foundry Data Sheet. Formulas for Determining Weights of Castings. *Foundry,* v. 82, Jan. 1954, p. 173-174.

Data sheet. (To be continued.) (E25)

49-E. Shell Moulding of Cylinder Castings. A. Emmerson. *Foundry Trade Journal,* v. 95, Dec. 3, 1953, p. 687-696.

Pattern materials, cores, methods of reinforcing shells and pouring procedures. Photographs. (E16, CI)

50-E. Zircon Sand. M. R. Hinchcliffe. *Metal Industry,* v. 83, Nov. 27, 1953, p. 437-440.

Merits as a core material for severe casting conditions. Graphs, photographs, diagram. 9 ref. (E18)

51-E. Quality Control in the Production of Wrought Aluminum Alloys. R. T. Staples and J. Hurst. *Metal Progress,* v. 65, Jan. 1954, p. 136, 138, 140, 142.

Previously abstracted from the original in *Journal, Institute of Metals.* See item 186-E, 1953. (E10, S general, Al)

52-E. (French.) **Pressure Casting.** Robert Girard. *Métallurgie et la construction mécanique,* v. 85, no. 10, Oct. 1953, p. 787, 789.

Advantages and application of method. Diagrams. (E13)

53-E. (French.) **The Cupola Furnace and the Superheating of the Cast Metal.** J. Pascal. *Métallurgie et la construction mécanique,* v. 85, no. 10, Oct. 1953, p. 779, 781, 783-784.

Superheating by means of oxygen-enriched blast. Theoretical basis for the problem including an outline of thermal balance. Graphs, tables. 39 ref. (E10)

54-E. (German.) **Efficiency of Coreless Low-Frequency Crucible Induction Furnaces for Gray Iron.** F. Deutz. *Giesserei,* v. 40, no. 23, Nov. 12, 1953, p. 609-614.

Current consumption and efficiency of 1.5, 3, and 6-ton furnaces from three typical foundries. Advantages of the coreless furnace. Tables, graphs, photographs. (E10, CI)

55-E. (Spanish.) **Directed Segregation in Cast Iron.** José M. Sistiaga. *Ciencia y técnica de la Soldadura,* v. 111, no. 14, Sept.-Oct. 1953, 4 p.

Identification, origin and mechanism of segregations. Micrographs. (E25, CI)

56-E. (Swedish.) **Systematizing Machine Molding of Small Castings.** E. O. Lissell. *Gjuteriet,* v. 43, no. 9, Sept. 1953, p. 159-163.

Properties of molding sand. Molding with stationary and portable machines compared. Photographs, diagrams. (E18, E19)

57-E. (Swedish.) **Experiments With Different Types of Feeders.** Bertil Thyberg. *Gjuteriet,* v. 43, no. 10, Oct. 1953, p. 175-181.

Design and operation of new type pouring cup for casting malleable iron. Diagrams, micrographs, photographs. (E23, Fe)

58-E. (Swedish.) **Exchangeable Pattern Plates in Frames.** Henry A. Nilsson. *Gjuteriet,* v. 43, no. 10, Oct. 1953, p. 182-184.

Difficulties of producing small castings economically in mechanized foundry. Photographs, table. (E17)

59-E. Modern Swiss Foundry Incorporates Automatic Controls. Victor Frey. *Foundry,* v. 82, Jan. 1954, p. 104-109.

Equipment, plant layout and operating procedures. Diagram, photographs. (E general)

60-E. A B C of Foundry Practice. II. Core Blowing Equipment and Use. Pat Dwyer. *Foundry,* v. 82, Jan. 1954, p. 168, 171.

Principles and techniques of process of two manufacturers. Diagrams. (E21)

61-E. Plaster Moulded Aluminium Patterns. *Light Metals,* v. 16, Dec. 1953, p. 396-397.

Advantages of plaster molding and production of the patterns. Photographs. (E16, E17, Al)

62-E. (French.) **Desulfurization Conditions in the Hot-Blast Cupola.** Marcel Guédras. *Métallurgie et la construction mécanique,* v. 85, no. 11, Nov. 1953, p. 863, 865, 867.

Advantage of using magnesium liquid slags. Presence of pure dolomite when operating at 500 to 600° C. assures production of high-quality melt. 5 ref. (E10, CI)

63-E. (Hungarian.) **Theory and Practical Application of High-Speed Casting.** Miklos Csiszar. *Ontöde,* v. 4, no. 9, Sept., p. 189-196.

New high-speed casting method based on filling the mold fast enough so temperature is nearly equal in all parts of the mold. Air and gas conduction is modified in a manner that prevents the gases from getting into the mold. Details of the process. Graphs, tables, diagrams. (E19)

64-E. (Book.—German.) **(A Comprehensive Treatise on Metal Founding.) Das Giessereiwesen in gemeinfasslicher Darstellung.** H. Schmidt. Ed. 3. 349 p. 1953. Giesserei Verlag, Dusseldorf, Germany. 24 D.M.

A joint effort of three foundrymen's associations and 18 collaborators. A condensed encyclopedia dealing with every phase of foundry work from early history to finished modern castings. Includes making of patterns; materials, manufacture and drying of molds and cores; molders' tools; fuels used in the foundry; raw materials for iron and steel, nonferrous and light metals; melting furnaces; calculation of composition of charge; preparation of molds and pouring methods; cleaning of castings; heat treatment and improvement of surfaces; properties and methods of testing; defects; arrangement and floorspace of foundries; heat and power requirements; costs. Not written for experts, but for those who wish to become experts. W. Trinks. (E general)

65-E. (Book—German.) **(Course of Fundamental Instruction for Molders.) Grundlehrgang für Former.** Dellwig and Esch. 89 p. 1952. Giesserei Verlag, Dusseldorf, Germany. 5.60 D.M.

A three months' course of instruction for apprentices, explaining every step in the molding operation in detail. W. Trinks. (E19)

66-E. (Book—German.) **(Defects in Castings.) Fehlererscheinungen an Guss-Stücken.** E. Knipp. 261 p. 1953. Giesserei Verlag, Dusseldorf, Germany, 26 D.M.

Deals with pipes, cavities, blowholes, nonmetallic inclusions, sand-filled depressions, burnt-in sand, incomplete filling of mold, segregations, cracks and warping. Causes and prevention in cast iron, malleable, steel castings, heavy nonferrous metals and light metals. Widely differing treatment is needed for prevention of defects in different metals. Probably the only comprehensive treatise on this subject in book form. 280 ref. W. Trinks. (E25)

67-E. (Book.) **The Foseco Foundryman's Handbook.** 231 p. Foundry Services, Long Acre, Nechells, Birmingham, England. 7s. 6d.

Discusses light casting alloys, nonferrous casting alloys, iron castings, and die casting. Tables. (E general)

68-E. (Book—German.) **(What Every Coremaker Must Know About His Job.) Was jeder Kernmacher von seiner Arbeit Wissen Muss.** C. Pfannenschmidt. 70 p. 1952. Giesserei Verlag, Dusseldorf, Germany. 3.60 D.M.

Course of apprentice training for specialized operations. What to watch for and what will happen under concrete conditions. Instructors will find valuable. W. Trinks. (E21)

69-E. (Book—German.) **(What Every Molding Machine Operator Must Know About His Job.) Was jeder Maschinenformer von Seiner Arbeit Wissen Muss.** H. Gries. 64 p. 1952. Giesserei Verlag, Dusseldorf, Germany. 3.20 D.M.

Course of apprentice training for specialized operations. What to watch for, and what will happen under concrete conditions. Instructors will find valuable material for improving their courses. W. Trinks. (E19)

70-E. Blow-In Core Driers Used for Close Tolerances. *American Foundryman,* v. 25, Jan. 1954, p. 40-43.

By combining two established molding methods in one casting operation, aluminum core driers can be produced with such smooth finish as to minimize machining and tooling in cavities. Process uses conventional green sand molding for cope and cheek, permanent mold for drag. Photographs. (E19, E12, Al)

71-E. Foundry Facts. Chill Testing of Cast Iron. *American Foundryman,* v. 25, Jan. 1954, p. 65-66.

Data sheet for wedge and chill test procedures. Diagrams, table. (E25, CI)

72-E. Carbon Equivalent and Fluidity. E. R. Evans. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Dec. 1953, p. 118-123.

Fluidity of hypo-eutectic cast irons at any temperature increases with carbon equivalent until a critical value is reached. Graphs, tables. 7 ref. (E25, CI)

73-E. Shell Moulding Machine. *Engineer,* v. 196, Dec. 25, 1953, p. 847.

Equipment and operating procedures. Photographs. (E16)

74-E. Continuous Flow From Casting Through Shipping. *Flow,* v. 9, Jan. 1954, p. 82-85.

A single building with foundry and machine operations, quality

control, packaging and shipping are all integrated into one big process. Diagram, photographs.
(E general, G17, S12, A5)

75-E. Application of Shell Moulding to Steel Castings. C. Hand and P. R. Beeley. *Foundry Trade Journal,* v. 95, Dec. 17, 1953, p. 745-747, 759.

Discussion by actual producers concerning capabilities of process. Photographs. (E16, CI)

76-E. Experiences in the Exothermic Feeding of Grey-Iron Castings. J. Grice. *Foundry Trade Journal,* v. 95, Dec. 17, 1953, p. 749-757; disc., p. 757-758.

Developments and techniques which contribute to more economical, high-quality castings. Photographs, diagrams. (E23, CI)

77-E. Experiences in Degassing Aluminium Alloys. D. P. Sparham and E. A. Moult. *Foundry Trade Journal,* v. 95, Dec. 24, 1953, p. 777-781.

Early casting practices and degassing methods. Establishment of present practice and results obtained with new technique. Photographs, table. (E25, Al)

78-E. Practical Experience of Shell Moulding. C. Potter. *Foundry Trade Journal,* v. 95, Dec. 24, 1953, p. 783-785.

Includes photograph. (E16)

79-E. Metal Corebox Construction. F. H. Wakeham. *Foundry Trade Journal,* v. 95, Dec. 24, 1953, p. 789-790.

Advantages over wood, and design, construction and machining. Diagrams. (E21)

80-E. The Investril System of "Lost-Wax" Precision Casting. *Machinery (London),* v. 83, Dec. 18, 1953, p. 1207-1209.

A system converting a high production process to producing medium as well as small quantities economically. Photographs, drawing. (E15)

81-E. Quality Control Applied to Die Casting. H. R. Haag. *Machinery (London),* v. 83, Dec. 25, 1953, p. 1263-1268.

Advantages of checking samples and necessity of proper test equipment. Table, micrograph, photographs. (E13, S12)

82-E. Designing Die Casting Dies for High-Speed Operation. H. K. Barton. *Machinery (London),* v. 83, Dec. 25, 1953, p. 1268-1276.

Consideration of die temperature ranges for satisfactory casting. Graph, charts, diagrams. (E13)

83-E. Type Founding. *Metal Industry,* v. 83, Dec. 11, 1953, p. 477-480.

Gages, molds and techniques of molding. Photographs. (E19)

84-E. Foundry Briefs: Sub-Cutaneous Porosity. *Metal Industry,* v. 83, Dec. 25, 1953, p. 525-526.

Factors influencing porosity in leaded nickel-bronze. Reports two alloys having similar though slightly different characteristics will not necessarily respond identically to the same founding conditions. Photograph, micrographs.
(E25, Pb, Ni, Cu)

85-E. Metal Casting Methods. IX. Cleaning and Fettling Practice. J. B. McIntyre. *Metallurgia,* v. 48, no. 290, Dec. 1953, p. 273-276.

Operations necessary, after casting has been removed from mold, to prepare it for shipment to customer. Includes cleaning off adherent sand and removal of surplus metal. Photographs, table. (E24)

86-E. You Can Use Lead Where Precision Dimensions and Weight Are Needed. J. B. Lazarus. *Precision Metal Molding,* v. 12, Jan. 1954, p. 38-39, 91.

Advantages of rubber molds and centrifugal casting of lead. Photographs. (E14, Pb)

87-E. Mercast Valve Body Shows How Booking Allows More Design Latitude. *Precision Metal Molding,* v. 12, Jan. 1954, p. 40-42.

New casting technique using frozen mercury patterns. Photographs, drawings. (E17, E15)

88-E. Metallic Sealing Compounds Can Be Used for Production Impregnation. *Precision Metal Molding,* v. 12, Jan. 1954, p. 59-60, 72-74.

Typical examples and results that have been achieved. Photographs. (E25)

89-E. Determination of Fluidity of Metals in Casting by Means of a Spiral Shell Mold. P. Schneider. Henry Brutcher, Altadena, Cal., Translation no. 3049, 6 p. + 1 plate. (From *Giesserei, Technisch-Wissenschaftliche Beihefte,* 1952, nos. 6-8, p. 379-381.)

Brief review of methods currently in use and their drawbacks. Photographs, diagrams, graph. 5 ref.
(E16, E25)

90-E. (Dutch.) **Electric Furnaces for the Iron Foundry.** *Bedrijf en Techniek,* v. 8, no. 190 (25), Dec. 1953, p. 540-541.

Use and energy consumption of various electric melting and heat treating furnaces. Photographs.
(E10, J general, CI)

91-E. (German.) **Zinc Alloys as Casting Materials.** G. Lieby. *Metall,* v.

7, nos. 21-22, Nov. 1953, p. 856-860.
Properties of zinc alloys and common methods of casting. Practical application of zinc pressure casting. Tables, diagrams, photographs. (E general, E13, Q general, Zn)

92-E. (Hungarian.) **The Basic Cupola.** Ferenc Varga. *Ontöde,* v. 4, no. 10, Oct. 1953, p. 205-213.
Different methods of desulfurization processes and development of basic-lined cupola. Operation and costs. Tables, graphs, diagrams. 20 ref. (E10, Mn, Mg, Cr, Ni, Mo, Cu)

93-E. (Hungarian.) **Modern Cleaning of Castings. II.** György Szvath. *Ontöde,* v. 4, no. 10, Oct. 1953, p. 216-218.
Dust collector installations in foundries and on polishing machines. Diagrams. (E24, L10)

94-E. (Hungarian.) **Copper Alloy Test Bar Cast in Sand.** Sandor Polgary. *Ontöde,* v. 4, no. 12, Dec. 1953, p. 248-249.
Proposes new method for casting test bars of special copper alloys. Results of method. Tables, diagrams. (E11, Cu)

95-E. (Hungarian.) **Improving the Quality of Castings by Decreasing the Extent of Burning on of Mold Parts.** Andras Toth. *Ontöde,* v. 4, no. 12, Dec. 1953, p. 254-257.
Significance of refractoriness of foundry sands and their grain size. Practical suggestions for cleaning castings and testing composition of sands as well as determining grain size. (E18, E24)

96-E. (Russian.) **New Tendencies in the Construction of Pouring Systems for Casting Under Pressure.** V. M. Pliatskii. *Liteinoe Proizvodstvo,* 1953, no. 8, Aug., p. 5-8.
Suggestions for obtaining castings with well-defined edges, precise contours and a minimum of porosity caused by air. Photographs, diagrams. (E23)

97-E. (Russian.) **Rational Cycle of the Impact Molding Machine.** L. A. Izrailevich. *Liteinoe Proizvodstvo,* 1953, no. 8, Aug., p. 9-11.
Theoretical presentation. Graphs. 4 ref. (E19)

98-E. (Russian.) **Test in the Application of Water Glass in Production of Foundry Molds.** P. I. Shportenko. *Liteinoe Proizvodstvo,* 1953, no. 8, Aug., p. 17-18.
Application resulted in clean, strong molds. Tables. (E19)

99-E. (Russian.) **Chill Casting of Large Parts From Al-2 Alloy.** K. N. Osminkin and B. D. Krifuks. *Liteinoe Proizvodstvo,* 1953, no. 9, Aug., p. 19-20.
Production model of a chill mold with a flexible metallic core securing free shrinkage in large castings. Photographs, diagrams. (E19, Al)

100-E. (Russian.) **Six-Spindle Centrifugal Machine for Casting Bronze Bushings.** D. M. Krymskii and N. I. Mishchenko. *Liteinoe Proizvodstvo,* 1953, no. 8, Aug., p. 27-28.
Machine decreased rejects 2 to 3% and increased yearly output. Table, diagrams. (E14, Cu)

101-E. Pressure Die-Casting Review. Die-Castings in the "Bendix" Washer. Brass Die-Casting Furnace. *Metal Industry,* v. 84, Jan. 8, 1954, p. 27-29.
Includes photographs, diagrams. (E13)

102-E. Founding Magnesium-Base Alloys. I. Shrinkage Porosity. M. Caillon. *Metal Industry,* v. 84, Jan. 1, 1954, p. 3-5.
Effects of shrinkage porosity. Chilling methods. Diagrams, photograph, graphs. (To be continued.) (E23, E25, Mg)

103-E. (German.) **Equipping a Modern Laboratory With Air Conditioning.** Erich Piper and Heinz Hagedorn. *Stahl und Eisen,* v. 73, no. 26, Dec. 17, 1953, p. 1720-1727.
Design and equipment of a modern foundry laboratory. Special emphasis is given to air conditioning. Diagrams, tables, graph, photographs. (E general, A9)

104-E. Dimensioning Castings. Elvin V. Lundstedt. *Machine Design,* v. 26, Jan. 1954, p. 98-110.
Recommendations for correct detail specifications on casting drawings to insure feasibility, low cost, and ease of manufacture. Photographs, drawings, diagrams. (E general)

105-E. Progress in Steelmaking. Rollmaking Art Goes Modern. *Steel,* v. 134, Jan. 18, 1954, p. 82, 84, 87.
Developments in equipment and techniques for casting steel mill rolls. Photographs, diagrams. (E11, CI)

106-E. Modern Casting Techniques. H. J. Meerkamp van Embden. *Philips Technical Review,* v. 15, Nov. 1953, p. 133-146.
Survey of development of metal casting. Sand, permanent metal mold, Croning, and lost-wax processes. Diagrams, photographs. 9 ref. (E11, E12, E15, E16)

107-E. Plastic Patterns. W. C. H. Dunn. *Canadian Metals,* v. 17, Jan. 1954, p. 26, 28-29.
Cast plastic patterns are not new, but their use was hindered by wartime shortages of resin and lack

of know-how. Advantages are apparent in several different fields of application. Photographs, table. (E17)

108-E. Production Shell Moulding. *Mechanical World and Engineering Record,* v. 134, Jan. 1954, p. 20-22.

Accuracy and high rate of output from systematized machine process. Photographs. (E16)

109-E. Clamping Shell Moulds. Dennis Brooks. *Canadian Metals,* v. 17, Jan. 1954, p. 24.

Includes diagram, illustrating method of clamping. (E16)

110-E. Founding Magnesium-Base Alloys. II. Methods of Chilling. M. Caillon. *Metal Industry,* v. 84, Jan. 8, 1954, p. 25-26.

Use of special sands of good thermal conductivity. Photographs, diagrams, graphs. 1 ref. (To be continued.) (E18, E23, Mg)

111-E. Foundry Prepares Own Refractory for Lining and Patching Cupolas. Herbert F. Scobie. *American Foundryman,* v. 25, Feb. 1954, p. 46-48.

Practice based on mixture that is used not only for daily patching but also for lining the cupola. Material is more economical than previous linings used and gives better metal control due to reduced burnout. Photographs, diagram. (E10)

112-E. New Mechanized Foundry Casts Permanent Magnets. *American Foundryman,* v. 25, Feb. 1954, p. 58-59.

General Electric's Carboloy Department, one of the world's most modern plants for the production of Alnico permanent magnets. Photographs. (E11, SG-n, Ni)

113-E. How Far Should We Go in Foundry Sand Control. Earl E. Woodliff. *American Foundryman,* v. 25, Feb. 1954, p. 60-65.

Sand control becomes increasingly complex as more sand additives and test methods are developed. A foundryman can go as far as he likes in controlling sands but he will always profit by observing well-established fundamentals in his molding operations. Photographs, table. (E18)

114-E. Magnesium Die Casting. G. F. Hodgson. *Foundry,* v. 82, Feb. 1954, p. 102-105, 252-256.

Light weight, good machinability, price and availability have put this metal on par with aluminum. Table, diagram, photographs. (E13, Mg)

115-E. The Foundryman Considers Quality. E. J. Jory. *Foundry,* v. 82, Feb. 1954, p. 112, 195, 198.

Means of improving quality and reasons for their adoption. (E25)

116-E. Casting Defects. Their Causes and Remedies. W. M. Halliday. *Foundry,* v. 82, Feb. 1954, p. 113, 183-184, 186, 188.

Common defects and recommendations for their elimination. (E25)

117-E. Mammoth Aluminium Wheel. J. R. Harrison. *Foundry Trade Journal,* v. 95, Dec. 31, 1953, p. 801-805.

Methods adopted for casting four aluminum alloy half-wheel castings of finished net weight 2,250 lb. each. Photographs, diagrams, table. (E11, Al)

118-E. Master Patternmaking Aids Production. H. Wilson. *Foundry Trade Journal,* v. 96, Jan. 7, 1954, p. 5-11.

Equipment and techniques employed. Photographs, diagrams. (To be continued.) (E17)

119-E. Control in an Investment Foundry. D. F. B. Tedds. *Foundry Trade Journal,* v. 96, Jan. 14, 1954, p. 37-42; Jan. 21, 1954, p. 77-80; disc., p. 80-82.

Layout and operation of a fully integrated high-production unit. Photographs. 2 ref. (To be continued.) (E15)

120-E. Special Report: Shell Molding Brings New Foundry Era. *Iron Age,* v. 173, Jan. 28, 1954, p. 55-57.

Equipment and processes in use, resulting in improved casting quality and cost reduction. Diagrams, photographs. (E16)

121-E. Foundry Core Sand Delivered by Air. E. J. Egan, Jr. *Iron Age,* v. 173, Jan. 21, 1954, p. 97-99.

Pneumatic system delivers sand from preparation centers to core-making machine. Photographs, diagram. (E18)

122-E. New Techniques Shorten Investment Casting Cycle. W. G. Patton. *Iron Age,* v. 173, Jan. 28, 1954, p. 115-117.

Process offers all advantages of lost wax process plus relatively high production per man-hour. Photographs. (E15)

123-E. Solidification of Steel. IV. Casting Methods. T. B. King. *Iron & Steel,* v. 27, Jan. 1954, p. 15-22.

Developments in centrifugal casting, investment casting, shell molding and continuous casting. Table. 81 ref. (E14, E15, E16, D9, CI)

124-E. Pressure-Pouring Steel Car Wheels. E. Q. Sylvester. *Mechanical Engineering,* v. 76, Feb. 1954, p. 152-158.

New process involves permanent molds machined from graphite. Photographs, table, diagrams, graph, photomicrographs. (E12, CI)

125-E. Founding Magnesiuum-Base Alloys. III. Risers. M. Caillon. *Metal Industry,* v. 84, Jan. 15, 1954, p. 43-45.

Design of and need for risers. Diagrams. (To be continued.) (E22, Mg)

126-E. Foundry Briefs. Cracks in Phosphor Bronze Wheel. *Metal Industry,* v. 84, Jan. 15, 1954, p. 46.

Probable contributing factors. Micrographs. (E25, Cu)

127-E. Founding Magnesium-Base Alloys. IV. Casting Design. M. Caillon. *Metal Industry,* v. 84, Jan. 22, 1954, p. 70-72.

Diagrams, graphs. (To be continued.) (E general, Mg)

128-E. Investment Casting. When and How to Use It. Edward Engel. *Tool Engineer,* v. 32, Feb. 1954, p. 77-80.

Production and design problems. Photographs. (E15)

129-E. Economics of Investment Casting—Benefits and Limitation of Process Evaluated. Allen O. Smith. *Western Metals,* v. 12, Jan. 1954, p. 60-62.

Equipment, techniques and factors affecting economics of process. Photographs. (E15)

130-E. Convection in Molten Metals. L. I. Sokol'skaya. Henry Brutcher, Altadena, Cal., Translation no. 2457, 13 p. (From *Izvestiya Akademii Nauk SSSR, Otd. Tekh. Nauk,* 1949, no. 9, p. 1365-1371.)

Previously abstracted from the original. See item 54-E, 1950. (E23)

131-E. Device for Determining the Fluidity and Rate of Flow of a Stream of Liquid Metal. L. L. Kunin. Henry Brutcher, Altadena, Cal., Translation no. 2516, 4 p. (From *Zavodskaya Laboratoriya,* v. 15, no. 7, 1949, p. 870-872.)

Previously abstracted from the original. See item 14A-167, 1949. (E25)

132-E. (French.) **Investigation of Microporosity in Castings of Magnesium Alloys.** Marcel Bardot. *Fonderie,* 1953, Nov., no. 94, p. 3687-3692.

Results of experiments investigating factors causing microporosities of magnesium alloys. Micrographs, diagrams, tables. 8 ref. (E25, Mg)

133-E. (Book.) **A Handbook on Die Casting.** F. D. Penny. 78 p. Her Majesty's Stationery Office, York House, Kingsway, London W.C. 2, England. 6s.

A service handbook to assist designers and those concerned with inspection and acceptance of die-cast parts.

(E13, Al, Mg, Sn, Pb, Cu, Fe)

134-E. (Book—French). **(Practical Guide to the Designing of Steel Castings.) Guide Practique du Tracé des Pieces en Acier Moulé. Ed. 2.** 64 p. Editions Techniques des Industries de la Fonderie, 12, Avenue Raphael, Paris 16. 40 fr.

Essential rules for producing sound castings economically. General properties of steel castings and chief defects due to poor design. (E general, CI)

135-E. Rational Foundry Management. F. Buckley. *Foundry Trade Journal,* v. 96, Jan. 28, 1954, p. 103-106.

Factors to be considered in equipment, plant layout, procedures and personnel attitudes. Diagram, photographs. (E general)

136-E. Impregnation of Metal Castings. *Foundry Trade Journal,* v. 96, Jan. 28, 1954, p. 107-108.

Survey of available methods and materials. (E25)

137-E. Cut Tool Costs, Simplify Design With Precision Casting. Stanley Snorek. *Iron Age,* v. 173, Feb. 11, 1954, p. 136-139.

Cost of making indentical tools and fixtures for assembly operations has been substantially reduced through wider use of precision casting methods. Photographs. (E15, TS)

138-E. Diecastings. Industry Uses More for Working Parts. J. J. Obrzut. *Iron Age,* v. 173, Feb. 11, 1954, p. 140-143.

Die casting provides low-cost method of making complex parts to close tolerances at high production rates. Photographs. (E13)

139-E. (German.) **The Melting of Cast Iron Shavings in the Cupola Furnace.** S. H. Chrobok. *Giesserei,* v. 40, no. 24, Nov. 26, 1953, p. 634-637.

Economic advantages of process which makes it possible to use shavings in the same manner as other metallic charges. Diagram, photograph, tables, graph. (E10, CI)

140-E. (German.) **Economical Melting of Brass and Bronze Alloys in Reverberatory Foundry Furnaces.** E. R. Thews. *Giesserei,* v. 40, no. 25, Dec. 10, 1953, p. 658-663.

Choice of furnace, furnace linings and melting procedure. (E10, Cu)

141-E. (German.) **Quality Control in the Malleable-Iron Foundry.** V. Unger. *Giesserei,* v. 40, no. 25, Dec. 10, 1953, p. 668-672.

Melting procedure, furnace lining and repair, sampling and testing. Diagrams, graphs, table. 6 ref. (E11, S12, CI)

142-E. (German.) **The CO_2 Hardening Process in the Foundry.** W. Schumacher. *Giesserei,* v. 40, no. 26, Dec. 24, 1953, p. 678-681.

New process of hardening molds and cores containing water-glass binder with flow of CO_2. Method shown to be more economical and superior to other methods. Photographs, table. (E18)

143-E. (German.) **Evaluation of Molding Machines.** W. Gesell. *Giesserei,* v. 40, no. 26, Dec. 24, 1953, p. 682-684.

Principles to be considered in comparing efficiency and maintenance costs of different molding machines. 6 ref. (E19)

144-E. (German.) **Specifications for the Production of Highly-Stressed Cast-Steel Parts.** *Giesserei,* v. 40, no. 26, Dec. 24, 1953, p. 684-685.

Importance of suitable equipment and procedure for proper casting. 6 ref. (E11, S22, CI)

145-E. (German.) **Recent Development in Construction of Pressure Casting Machine.** F. Richter. *Giesserei,* v. 41, no. 1, Jan. 7, 1954, p. 2-6.

Shows superiority of horizontal piston arrangement. Advantages and disadvantages of different ways of closing mold. Design and operation of new type machine. Diagrams, graph, photographs. (E13)

146-E. (German.) **Difference Between Hematite Pig Iron Cast in Sand and Chill Molds and Possibilities of Influencing the Structure of Chill-Mold-Cast Pig Iron.** J. Willems, W. Lückerath and H. Schroer. *Giesserei,* v. 41, no. 1, Jan. 7, 1954, p. 7-13; disc., p. 13-14.

Structure can be controlled by changing cooling rate. Photographs, graphs, micrographs. (E11, E19, CI)

147-E. (German.) **Evaluating Quality of Core Binders on Basis of Laboratory Tests.** A. Pack. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 33-38.

Tests on various sand core binders. Tables, graphs, photographs. 3 ref. (E18)

148-E. (German.) **Cupola-Furnace Operation. Hot Blast, Basic Cupola Furnace.** E. Piwowarsky. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 41-42.

Patented operation of basic-lined cupola furnaces with hot blasts up to 700° C. 4 ref. (E10)

149-E. (German.) **Combustion Processes in the Cupola Furnace.** H. Schiffers. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 42-44.

Reactions and equilibria of various gases with the carbon in the cupola furnace. Graphs. 16 ref. (E10)

150-E. (German.) **The Design of Modern Hot-Blast Cupola Furnaces With Consideration of New Metallurgical Information.** S. Tunder. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 44-45.

Features of modern cupola with respect of throat-gas exhaust, furnace charge intake, tuyeres and water cooling. Diagram. (E10)

151-E. (German.) **Hot-Blast Temperature for Cupola Furnaces.** A. Schack. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 45.

Importance of keeping a constant temperature of the hot blast in the regenerator. (E10)

152-E. (German.) **Pick-Up and Loss Conditions in Cupola Melting With Hot Blast.** E. Piowowarsky and H. Schiffers. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 47-49.

Melting with hot blast reduces loss of elements accompanying the charge because of a lower wind zone. Higher furnace temperature increases solvent power of iron and changes composition of the slag and its reactivity with the melt and furnace lining. Graph. 2 ref. (E10, CI)

153-E. **Basic Cupola Furnaces.** H. Schmidt. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 46-47.

Experimental results on effect of amount of coke and limestone on composition of melt and slag. Tables. 3 ref. (E10, CI)

154-E. (German.) **Computing Combustions and Determining the Functional Dependence of Variables in Cupola Melting With the Aid of Graphs.** W. Matejka. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 45-46.

Importance of monograms for determining operating conditions of hot-blast cupola furnaces. Graphs. 4 ref. (E10)

155-E. (German.) **Basic Melting.** O. Günthner. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 49.

Advantages to be considered in steel melting in basic-lined hot-blast cupola furnaces. (E10, CI)

156-E. (German.) **Three Years Plant Experience With Addition of Oxygen to the Cupola Furnace.** F. Brügger. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 49-50.

Equipment and procedure of melting with O_2-enriched blast and its economy. Graphs. (E10)

157-E. (German.) **Removal of Gases in Gray-Iron Casting.** A. Schmitz. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 51-52.

Various measures designed to allow gases to escape from green and dry-sand molds. Illustrated. Diagrams. (E19)

158-E. (German.) **Advances in Foundry Practice in the First Half Year of 1953.** Paul A. Heller. *Stahl und Eisen,* v. 74, no. 1, Jan. 1, 1954, p. 35-39; no. 2, Jan. 14, 1954, p. 106-107.
Reviews literature on solubility of carbon in molten iron; effect of silicon and manganese; mathematics of melting practice; composition and structure of molds; and various other works on foundry practice. Tables, graphs, diagrams, photomicrographs. 98 ref.
(E general, Fe, Si, Mn)

159-E. Castings for Gas Turbines. *Aeroplane,* v. 86, Feb. 12, 1954, p. 185-186.
Production of heat resisting centrifugal castings. Photographs.
(E14, SG-h)

160-E. New Foundry Handles Alloy Steels. A. Harrison. *Canadian Metals,* v. 17, Feb. 1954, p. 24, 26.
Operating procedures at new installation. Photographs.
(E general, CI)

161-E. Impregnating Magnesium Castings. *Canadian Metals,* v. 17, Feb. 1954, p. 28.
Magnesium alloy gear-box castings for aircraft industry are impregnated to ensure complete soundness of material. Photographs.
(E25, Mg)

162-E. Melting of Brass and Bronze. G. G. M. Carr-Harris. *Canadian National Research Council, Technical Information Service Report no.* 32, Nov. 1953, 25 p.
Data likely to be helpful in planning melting facilities for small foundry. Importance of satisfactory equipment and control measures. Tables, diagram. 52 ref. (E10, Cu)

163-E. Diecasting. *Iron Age,* v. 173, Feb. 18, 1954, p. 156-157, 160.
Vacuum method reduces internal porosity. Photographs. (E13)

164-E. Steel Castings Production. *Iron & Steel,* v. 27, Feb. 1954, p. 43-47.
Foundry which is notable for arrangement in same shop of separate flow-lines for mechanized, stack and jobbing molding all supplied with great variety of high-alloy steels from common melting division. Photographs, diagrams. (To be concluded.) (E19, CI)

165-E. Shell Mold Castings. T. W. Curry. *Materials & Methods,* v. 39, Feb. 1954, p. 102-104.
Adapted from a paper presented at the annual meeting of the Gray Iron Founder's Society, Oct. 1953. Dimensional tolerances, quality of finish, reduction of machining and cleaning operations. Photographs.
(E16)

166-E. Handling and Trimming Very Small Die Castings. H. K. Barton. *Machinery (London),* v. 84, Jan. 29, 1954, p. 244-252.
Increased problems encountered in trimming die castings as the plan areas of components diminish. Diagrams. (E13, E24)

167-E. Founding Magnesium-Base Alloys. V. Various Defects. M. Caillon. *Metal Industry,* v. 84, Jan. 29, 1954, p. 89-91.
Hot tears, cold shuts, draws and burning. Graphs, photographs. (To be continued.) (E general, Mg)

168-E. Founding Magnesium-Base Alloys. VI. Recurring Defects. VII. Input. M. Caillon. *Metal Industry,* v. 84, Feb. 5, p. 103-104; Feb. 12, 1954, p. 123-125.
Effect of composition on castability; effect of size of castings on ratio of metal handled to castings produced. (To be continued.)
(E general, Mg)

169-E. Faults in Pressure Die Castings. I. W. M. Halliday. *Metallurgia,* v. 49, no. 291, Jan. 1954, p. 35-40.
General introduction. Faults due to dimensional inaccuracy. Diagrams. (E13)

170-E. Economics of Shell Molding. Lyle L. Clark. *Steel,* v. 134, Feb. 22, 1954, p. 120.
If casting can be made fairly easily with resultant machine-shop saving, method is advantageous. Photographs. (E16)

171-E. (French.) **The Use of Foundry Sand Tests. Proposal for a Drawing Test.** Francois Boussard. *Fonderie,* 1953, Dec., no. 95, p. 3707-3714.
Various aspects of testing molding sands using standardized method proposed by American Foundrymen's Association. Disagreement was found between laboratory tests and actual foundry practice. Graphs, diagrams. (E18)

172-E. (French.) **The Study of Feedhead. Use of Exothermic Products.** Pierre Nicolas. *Fonderie,* 1953, Dec., no. 95, p. 3715-3725.
Size of feedhead, part of the piece in which it must act and how to assure feeding. Graphs, diagrams. 8 ref. (E23)

173-E. (French.) **Inserts in Light-Alloy Castings.** *Fonderie,* 1953, Dec., no. 95, p. 3726-3727.
Precautions for avoiding cracks or bubbles which occur around inserts; insufficient anchoring of insert. (E25, Al)

174-E. (French.) **Deslagging of Cast Iron During Casting.** *Fonderie,* 1953, Dec., no. 95, p. 3728-3730.

Slagging of castings and molds of various weights. Diagrams.
(E10, CI)

175-E. (French.) **Problem of Productivity in Belgian Foundries. A.** Dawans. *Revue universelle des mines,* v. 97, ser. 9, no. 10, Jan. 15, 1954, p. 3-7.
Mechanization, human relations, labor, resources, cost, quality and markets. 2 ref.
(E general, A general)

176-E. (French.) **Foundry Products, High Grade Materials for Mechanical Construction.** A. Dawans. *Revue universelle des mines,* v. 97, ser. 9, no. 10, Jan. 15, 1954, p. 7-17.
Quality of foundry products, competing methods, present situation and future possibilities. Photographs, table. 7 ref. (E general)

177-E. (Japanese.) **Cupola Operation With Oxygen Enriched Air.** Sunao Yoshioka. *Fuel Society of Japan, Journal,* v. 32, no. 319, Nov. 1953, p. 634-641.
Experiment on effect of added oxygen in cupola blast. Graphs, tables, diagrams, photographs.
(E10, CI)

178-E. (Russian.) **Mechanical Properties of Metal Castings Produced by the Lost Wax Process.** I. I. Goriunov and I. P. Bashkov. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb. p. 5-7.
Tensile tests on steel specimens cast in various configurations. Influence of casting procedure on heat treating properties. Tables, photographs. 4 ref. (E15, Q23, CI)

179-E. (Russian.) **Application of Metal Grids in Chill Casting.** I. V. Mrygin. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 7-8.
Investigates use in casting light alloys. Diagrams. (E22, Al)

180-E. (Russian.) **Removal of Sulfur With Magnesium During Processing of Cast Iron.** K. I. Vashchenko, P. V. Avrinskii and B. M. Pashkovskii. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 9-14.
Desulfurization action of magnesium with consideration of temperature and time factors. Tables, graphs, photographs, micrographs. 4 ref. (E25, CI)

181-E. (Russian.) **Filling a Duct in a Sand Mold.** B. B. Guliaev, V. M. Shpeizman and P. E. Kovalenko. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 15-17.
Study of metal flow in a mold. Graphs, diagrams, table. 3 ref.
(E25)

182-E. (Russian.) **Determining the Coefficient of Discharge of Pouring Systems for Steel Castings.** M. A. Kremer and V. N. Dudorova. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb. p. 17-23.
Cross section of intake duct, coefficient of resistance and influence of duct contour. Diagrams, table. 4 ref. (E23, CI)

183-E. (Russian.) **Casting of Automotive Camshaft.** V. A. Zakharov. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 27-29.
Mechanical properties shown to be equal to conventional shafts. Micrographs, photographs, table. (E general, Q general, AY)

184-E. (Russian.) **Melting of Non-Briquetted Cuttings in the Cupola Furnace.** Iu. S. Sukharchuk and M. P. Nikolaichik. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 30-31.
Melts were composed of steel, cast iron and mixed cuttings. Graphs. (E10, CI, ST)

185-E. (Swedish.) **Feeding and Solidification. I. Controlled Solidification.** K. Åkesson. *Gjuteriet,* v. 43, no. 12, Dec. 1953, p. 209-221.
Principles of directed solidification. Influence of form of casting, feeding system, rate of pouring, pouring temperature and molding materials with different thermal characteristics. Tables, diagrams, graphs. 27 ref. (E23, E25, CI)

186-E. Foundry Flexibility Permits Versatile Plant Operation. Harold J. Wheelock. *American Foundryman,* v. 25, Mar. 1954, p. 34-36.
Compounding its metals synthetically, one plant achieves predictable uniformity and accuracy of control in its castings, allowing minimized machining and close adherence to customer specifications. Photographs, diagram. (E general)

187-E. Use of Dielectric Ovens Speeds Core Production. Greg Minogue. *American Foundryman,* v. 25, Mar. 1954, p. 37-39.
With new ovens and addition of conveyor belt, production has increased 15% and better cores are produced by Moline Malleable Iron Co., St. Charles, Ill. Photographs, diagram. (E21)

188-E. Productivity Ideas Increase British Output at Small Cost. *American Foundryman,* v. 25, Mar. 1954, p. 42-46.
How visits of overseas Productivity Teams to U. S. foundries have paid off. Photographs. (E general)

189-E. Foundry Facts. *American Foundryman,* v. 25, Mar. 1954, p. 47-48.
Mold sand mixture data sheet.
(E18)

190-E. Casting Quality as Related to pH Value of Molding Sands. Victor

E. Zang and Gerald J. Grott. *American Foundryman,* v. 25, Mar. 1954, p. 49-59.

Better control of molding sand properties and marked reduction in casting defects accompanied adjustment of pH in green sand mixtures. Tables, graphs, photographs, diagram. 9 ref. (E18)

191-E. Shell Molds for Titanium Castings. R. M. Lang. *American Foundryman,* v. 25, Mar. 1954, p. 60-62.

Although zirconium oxychloride wash reduces degree of subsurface contamination of titanium cast in shell molds of silica, zircon and zirconia, it does not decrease over-all depth of contamination. However, the wash does improve surface finish of the casting and drastically reduces amount of pinholing. Washed zircon and zirconia molds give better surface finish to castings thicker than 1 in., but have no superiority over washed silica molds in terms of subsurface contamination. Graphs, photographs. 6 ref. (E16, Ti)

192-E. Methods for Special Pipe Production in Australia. G. J. Benson. *American Foundryman,* v. 25, Mar. 1954, p. 63-67.

Production of gray iron pipe and fittings for irrigation. Official Exchange Paper from the Australian Branch of the Institute of British Foundrymen. Diagrams. (E11, CI)

193-E. Magnesium Sand Foundry Produces Varied Castings. Robert H. Herrmann. *Foundry,* v. 82, Mar. 1954, p. 102-107.

Equipment, plant layout and operating procedures. Photographs, table. (E11, Mg)

194-E. Band Filing Helps Reduce Foundry Costs. H. J. Chamberland. *Foundry,* v. 82, Mar. 1954, p. 108-109.

Equipment and techniques. Photographs. (E24)

195-E. Foundry Research in England. William S. Pellini. *Foundry,* v. 82, Mar. 1954, p. 112-113, 296-302.

Organizational setup and types of work pursued. Photographs. (E general)

196-E. Cast-Weld Construction. John Howe Hall. *Foundry,* v. 82, Mar. 1954, p. 114-119.

Cast-weld pieces often are better and cheaper than a one-piece casting or an assembly in which no cast parts are used. Photographs. (E16, CI)

197-E. Alloy Gray Iron—What Does it Cost? *Foundry,* v. 82, Mar. 1954, p. 122-123, 311-314.

Determination of cost of special alloy irons when produced by adding alloys to base metal. Photograph. (E general, A4, CI)

198-E. Highly Mechanized Foundry. *Foundry,* v. 82, Mar. 1954, p. 138, 140.

New automatic shell molding machine which comprises basic production element. Photographs, diagram. (E16)

199-E. Trade Names of Foundry Equipment, Supplies and Services. *Foundry,* v. 82, Mar. 1954, p. 165-204.

Directory of producers of machines, materials and service distributed under various trade names and trade marks. (E general, A10)

200-E. Foundry Data Sheet. Formulas for Determining Weights of Castings. *Foundry,* v. 82, Mar. 1954, p. 207-208.

Data sheet. Diagrams, table. (E general)

201-E. Melting Iron in the Reverberatory Furnace. Carl G. de Laval. *Foundry,* v. 82, Mar. 1954, p. 224, 226, 228, 230, 232-234.

Factors affecting highest operating efficiency. (E10, CI)

202-E. ABC of Foundry Practice. Core Blowing Equipment and Use. IV. *Foundry,* v. 82, Mar. 1954, p. 237-238.

Maintenance and operation of equipment. (E21)

203-E. Core Blowing in a Steel Foundry. K. G. Marshall. *Foundry,* v. 82, Mar. 1954, p. 304-309.

Based on material originally presented by the author at the Technical and Operating Conference of Steel Founders' Society of America, 1952. Equipment and techniques. Photographs, table. (E21, CI)

204-E. Quantity Production of Engineering Castings. J. Burrell. *Foundry Trade Journal,* v. 96, Feb. 11, 1954, p. 149-155.

Cast iron foundry and methods of producing castings in widely varying batch amounts involving frequent pattern changes. Photographs, diagram. (To be continued.) (E general, CI)

205-E. Why Sand Control? C. A. Sanders. *Foundry Trade Journal,* v. 96, Feb. 11, 1954, p. 165-168.

Benefits obtained by close control of foundry sands. (E18)

206-E. Bell Founding. H. M. Howard. *Foundry Trade Journal,* v. 96, Feb. 18, 1954, p. 177-180; disc., p. 180-182.

Emphasis on qualities of casting which confer sonic excellence and tonal purity and necessary practical foundry methods undertaken to insure both. (E general, Cu, Sn)

207-E. Quantity Production of Engineering Castings. J. Burrell. *Found-*

ry Trade Journal, v. 96, Feb. 18, 1954, p. 183-190.

Various types of castings and methods of production. Photographs. (E general, CI)

208-E. **Titanium Casting Experiments.** *Light Metal Age,* v. 12, Feb. 1954, p. 24, 26, 28.

Process involves use of a vacuum and inert atmosphere arc-melting furnace and a special, but relatively inexpensive, method of making molds. Diagrams, photographs. (E10, E19, Ti)

209-E. **Casting Titanium.** *Metal Industry,* v. 84, Feb. 19, 1954, p. 143-144.

Development work on mold preparation and vacuum furnace. Diagram, photograph, table, radiograph. (E19, Ti)

210-E. **Founding Magnesium-Base Alloys. VIII. Pouring Systems.** M. Caillon. *Metal Industry,* v. 84, Feb. 19, 1954. p. 145-147.

Gates, runners and pouring basins. Photographs, diagrams. (To be continued.) (E22, E23, Mg)

211-E. **Progress in Shell Moulding.** *Metal Treatment and Drop Forging,* v. 21, Feb. 1954, p. 57-60.

Essential technique and subsequent development. Photographs. (E16)

212-E. **Many Factors Affect Linear Shrinkage on Medium, Large Steel Castings.** Hubert Chappie. *Western Metals,* v. 12, Feb. 1954, p. 62-64.

Factors causing hindered contraction, including effect of mold design, cores, green sand vs. dry sand, pockets in cope calling for excessive gaggering and bars in the flasks, ramming and several heads on one job. Photographs. (E25, CI)

213-E. **The Reaction of Solid Iron With Molten Aluminum Alloys Containing Zinc.** K. Schneider and H. Kessler. *Henry Brutcher, Altadena, Calif., Translation no.* 3168, 7 p. (From *Metall,* v. 7, nos. 15-16, 1953, p. 608-610.)

Previously abstracted from the original. See item 580-E, 1953. (E25, Al, CI, CN, Zn)

214-E. (Book—German.) (Molding Sand and Molding Materials.) **Die Formsande und Formstoffe.** Karl Schiel and Robert Willy Muller. 2nd Ed. 251 p. Wilhelm Knapp Verlag, Halle, Germany. 7.80 D.M.

Data on nature and structure of sand. Uses in specific types of foundries. (E18)

215-E. **Costs can be Saved by Controlling Diecasting Temperatures.** *Canadian Metals,* v. 17, Mar. 1954, p. 33.

Maintenance of temperature controls and adequate provision of instruments improves die-casting efficiency. (E13, S16)

216-E. **Steel Castings Production.** *Iron & Steel,* v. 27, Mar. 1954, p. 89-91.

Shop practice including fettling, inspection and foundry service. Photograph, diagrams. (E11, CI)

217-E. **Diecasting. New Uses Pace Its Growth.** R. L. Hatschek. *Iron Age,* v. 173, Mar. 18, 1954, p. 73-74.

Automatic transmissions help push aluminum die casting to all-time high. Compares production statistics for aluminum, magnesium and zinc die castings. Graph. (E13, Al, Mg, Zn)

218-E. **Small Foundry Switches to Shell Molding.** J. C. Jensen. *Iron Age,* v. 173, Mar. 18, 1954, p. 148-150.

Equipment, plant layout and operating procedures. Photographs. (E16)

219-E. **Titanium Casting.** *Iron & Steel,* v. 27, Mar. 1954, p. 102.

Process involves use of vacuum and inert-atmosphere arc-melting furnace and a special, but relatively inexpensive, method of making molds. Photograph, radiograph, table. (E10, E19, Ti)

220-E. **Some Examples of Non-Ferrous Castings Produced in Shell Moulds.** *Machinery (London),* v. 84, Feb. 19, 1954, p. 378-379.

System used in British foundry. Photographs. (E16)

221-E. **Problem: To Reduce Mass Without Sacrificing Rigidity.** J. B. Lyons and A. M. Cambell. *Precision Metal Molding,* v. 12, Mar. 1954, p. 38-40, 94-95.

Investment casting, a possible solution, presents advantages over machined and sand cast parts. Photographs, diagram. (E15)

222-E. **It Couldn't Be Cast.** *Precision Metal Molding,* v. 12, Mar. 1954, p. 41-42, 89-90.

Radio face panel, difficult to die cast, but almost impossible economically by any other method, was recently completed by a small Eastern die casting firm. Photographs. (E13, Al)

223-E. **Hand Tool Built With 10 Die Castings.** Herbert Charlop. *Precision Metal Molding,* v. 12, Mar. 1954, p. 44-45.

Use of aluminum for its light weight and die casting to lower machining costs. Photographs. (E13, Al)

224-E. **Cast Anodes for Cathodic Protection Are 4-Ways Better.** Albert Graver. *Precision Metal Molding,* v. 12, Mar. 1954, p. 48-49, 84.

Permanent mold casting allows control of impurities and a more efficient corrosion pattern. Anodes are easier to attach because core wire protrudes from the end. Drawing, table, diagram. (E12, R10, Mg)

225-E. Evaluation of Casting Processes. P. W. Beamer and S. C. Tingquist. *Product Engineering,* v. 25, Mar. 1954, p. 139-144.

Size and weight, physical properties, dimensional tolerances, configuration, activity and cost in selection of best process. Photographs, table. (E general)

226-E. Effective Methods of Inoculating Cast Iron. A. F. Durnienko. *Henry Brutcher, Altadena, Calif., Translation no.* 3162, 4 p. (From *Liteinoe Proizvodstvo,* v. 4, no. 6, 1953, p. 9, 15.)

Difficulties encountered in addition of inoculants to cast iron for a spheroidal graphite structure arise from their low melting and boiling points. (E25, CI)

227-E. The Croning Shell-Molding Process. A New German Development. F. Pölzguter. *Henry Brutcher, Altadena, Calif., Translation no.* 3183, 11 p. (Condensed from *Die Giesserei,* v. 39, no. 19, 1952, p. 467-472.)

Development of process, particulars on molding materials and preparation of patterns and pattern plates. Photographs, diagrams. 2 ref. (E16)

228-E. (French.) **"Shower-Collar" Method Applied During Green-Sand Molding to a Bronze Piece of Large Dimensions.** *Fonderie,* 1954, Jan., no. 96, p. 3775-3777.

Method of molding a bronze piece in the form of a ring-shaped dish. Photographs, diagram. (E19, Cu)

229-E. (French.) **Rejects in the Foundry.** J. Pascal. *Métallurgie et la construction mécanique,* v. 86, no. 1, Jan. 1954, p. 25, 27-29.

Over-all economic viewpoint of an industry. Examples. Diagrams, graphs. (To be continued.) (E general)

230-E. (German.) **Synthetic Molding Sand and Its Application in Gray Iron Foundries.** K. Houben. *Giesserei,* v. 41, no. 4, Feb. 18, 1954, p. 81-86.

Testing at normal and elevated temperatures and application and possibilities. Graphs, photographs. 5 ref. (E18, CI)

231-E. (Hungarian.) **The Hot-Air Cupola Furnace, and Its Present-Day Position.** Ferenc Varga. *Ontöde,* v. 5, no. 1, Jan. 1954, p. 1-9.

Effect of hot air on combustion process, air heating installations, metallurgy of the furnace and advantages in comparison with cold air cupola furnaces. Graphs, diagrams. 29 ref. (E10)

232-E. (Hungarian.) **Problems of the Material for the Charge of Modified Cast Iron.** Gyula Nandori. *Ontöde,* v. 5, no. 1, Jan. 1954, p. 9-17.

High-strength cast irons manufactured under Hungarian conditions of equipment and raw material. Relative merits of cupola and reverberatory furnaces. Diagrams, micrographs, tables. 32 ref. (E10, CI)

233-E. (Hungarian.) **Reasons for Defects in Magnesium Castings and Methods for Their Elimination.** Gyula Emod and Pal Németh. *Ontöde,* v. 5, no. 2, Feb. 1954, p. 41-46.

Factors causing defects. Suggests improved working methods. Photographs, tables. 6 ref. (E general, Mg)

234-E. (Hungarian.) **New Material Standards in Iron Casting.** Péter Dura. *Tobbtermelés,* v. 8, no. 2, Feb. 1954, p. 42-43.

Points taken into consideration when determining standards are design of casting, technology of process used, weight and destination of casting. Categories described. Example of a standard form. Diagram, table. (E general, S22, CI)

235-E. (Swedish.) **Feeding and Solidification. II. Feeders.** K. Akesson. *Gjuteriet,* v. 44, no. 1, Jan. 1954, p. 1-10.

Influence of feeding pressure. Diagrams, graphs, tables. 22 ref. (E23)

236-E. Gating Factors. W. H. Johnson, H. F. Bishop and W. S. Pellini. *Foundry,* v. 82, Apr. 1954, p. 102-107, 271-272.

Simple working concepts the foundryman can apply to practical design of gates. Diagrams, graphs, photographs, radiographs. 9 ref. (E22)

237-E. Progressive Policies Feature Successful Steel Foundry. Robert H. Herrmann. *Foundry,* v. 82, Apr. 1954, p. 108-110, 262-265.

Principles of free enterprise system developed highly efficient working team for production of steel castings. Photographs. (E general, A6, CI)

238-E. Recent Developments in High-Pressure Molding. Tom Barlow and W. R. Adams. *Foundry,* v. 82, Apr. 1954, p. 111, 257-261.

Sand flowability, molding pressure and mold shape, including flask clearance and sand-bearing surface. Diagrams. (E19)

239-E. Cold Cracks in White Iron. E. J. Jory. *Foundry,* v. 82, Apr. 1954, p. 122-123, 266-268.

Causes of cold cracking and hot tearing in production of malleable castings. Outline of mechanism which produces residual stresses. Means by which these stresses may be controlled. Diagrams. (E25, Q25, CI)

240-E. Foundry Specializes in Close-Tolerance Castings. Frank Warga. *Foundry,* v. 82, Apr. 1954, p. 124-127.

Success is attributed to close sand control, care in melting, gating system and a 4-2-1 ratio for risers, runners and sprue. Photographs. (E11, Al, CI, Fe, SS)

241-E. Manganese Bronze Gating Problems. *Foundry,* v. 82, Apr. 1954, p. 128-129.

Castings of manganese bronze should be bottom gated, a runner extension usually added, metal filtered through skim gates or dams to eliminate dross and molds gently filled to avoid folds or scabbing. Photographs. 1 ref. (E22, Cu, Zn)

242-E. Foundry Cuts Costs With Moderate Investment. *Foundry,* v. 82, Apr. 1954, p. 172-173, 175.

Man-hour savings of 62.5% and coke reduction of about 15% resulted from modernization of cupola charging methods. Photographs. (E10)

243-E. Iron and Steel Foundries Regulations 1953; Their Relationship to Safety. George Barnett. *Foundry Trade Journal,* v. 96, Mar. 11, 1954, p. 265-269.

Historical background, main safety provisions, regulations regarding gangways, pouring aisles and dust hazards and shake-out operations. Table. (E general, A7)

244-E. Estimation and Influence of the Gaseous Elements in Cast Iron. L. W. L. Smith and J. V. Dawson. *Foundry Trade Journal,* v. 96, Mar. 4, 1954, p. 233-238, Mar. 11, 1954, p. 275-280.

Formation of hot tears, inverse chill, variations in chilling tendency and differences in annealability of malleable iron as affected by variations in gas content. Tables, photographs, micrographs, graphs. 28 ref. (To be continued.) (E25, CI)

245-E. The Fordath D-Process. *Machinery (London),* v. 84, Mar. 5, 1954, p. 501-505.

Experiments on development of a quick-drying oil and method of blowing shell molds with mixture of this oil and fine silica sand. Photographs. (E16)

246-E. Founding Magnesium-Base Alloys. X. Fundamental Design. XI. Design Factors. M. Caillon. *Metal Industry,* v. 84, Mar. 5, 1954, p. 185-186; Mar. 12, 1954, p. 211-213.

Principal considerations in design of castings. Diagrams, graph, table. (To be continued.) (E general, Mg)

247-E. Pouring Ductile Iron. Ray Orr. *Western Machinery and Steel World,* v. 45, Mar. 1954, p. 91-93.

Gray iron becomes ductile iron when it is inoculated with magnesium alloys. Procedure changes usual graphite structure from flake to spheroidal form. Ductile iron is changed to ferrite form by heating. Photographs, table. (E25, CI)

248-E. (English.) **Faults in Pressure Die Castings. II.** W. M. Halliday. *Metallurgia,* v. 49, no. 292, Feb. 1954, p. 55-60.

Surface and mechanical defects. Photographs. (E13, Q general)

249-E. (German.) **The Ladle Treatment of Cast Iron With Metallic Magnesium.** A. Wittmoser. *Giesserei,* v. 41, no. 5, Mar. 4, 1954, p. 105-108.

Method introduces magnesium chips and granules with a stream of nitrogen or air as means of producing spheroidal graphite. Diagrams, table, micrographs. 20 ref. (E25, CI, Mg)

250-E. (German.) **Reactions on Mold Surface.** H. Reininger. *Giesserei,* v. 41, no. 5, Mar. 4, 1954, p. 109-111.

Effect of casting heat on synthetic molding sand. Gas permeability and shear and compression strength of synthetic compared with natural sand molds. Tables, micrographs, diagram, photograph. 11 ref. (E18)

251-E. (German.) **Investigations on Molding Sands.** E. Wagner, H. Schlichtenmayer, H. Staud and G. Weber. *Giesserei,* v. 41, no. 5, Mar. 4, 1954, p. 111-113.

Effect of vermiculite additions on gas permeability, compression and shear strength of synthetic sand containing bentonite and effect of water content on properties. Tables, graphs. (E18)

252-E. (German.) **The Austenal Lost-Wax Process.** H. J. Marshall. *Giesserei,* v. 41, no. 5, Mar. 4, 1954, p. 120-123.

Strength properties of various as-cast precision castings of cobalt alloy and different steels. Photographs, table. (E15, Co, ST)

253-E. Calcium Carbide Injection. A New Foundry Tool. H. E. Hender-

son and J. M. Crockett. *American Foundryman,* v. 25, Apr. 1954, p. 34-43.

Finely divided calcium carbide injected into molten iron by means of dry nitrogen removes sulfur, permits use of more economical alloy additions and provides a base for conversion to spheroidal graphite. Diagrams, photographs, tables, graphs, micrographs. 3 ref. (E10, E25, CI)

254-E. Heat Transfer Characteristics of Metals Cast in Shell Molds. R. E. Morey, H. F. Bishop and W. S. Pellini. *American Foundryman,* v. 25, Apr. 1954, p. 46-50.

Solidification characteristics of metals cast into shell molds with back-up are similar to those of sand castings. Without back-up, differences dependent on specific conditions may develop. Photographs, graphs, tables. 3 ref. (E16)

255-E. Pouring Temperature Effect on Steel Castings. C. F. Christopher. *American Foundryman,* v. 25, Apr. 1954, p. 51-55.

Temperature relationship between freezing casting surface and molten core of casting determines susceptibility to porosity. Diagram, photograph, graphs, table. (E23, E25, CI)

256-E. Gating and Risering of Magnesium Alloys. I. H. E. Elliott. *American Foundryman,* v. 25, Apr. 1954, p. 56-62.

Casting defects caused by faulty gating and risering can be minimized using techniques developed by suppliers of magnesium alloy aircraft castings. Diagrams. (To be continued.) (E22, Mg)

257-E. Foundry Facts. Recommended Names for Gates and Risers. *American Foundryman,* v. 25, Apr. 1954, p. 63-65.

Data sheets. (E22)

258-E. Fluidity vs. Core Blows in Automotive Gray Iron. Allen A. Evans. *American Foundryman,* v. 25, Apr. 1954, p. 66-68.

Gas inclusions and porosity trends predicted by measuring iron fluidity with new test. Photographs. (E25, CI)

259-E. Gating Yellow Brass Castings for Greater Production Economy. C. L. Mack. *American Foundryman,* v. 25, Apr. 1954, p. 70-74.

Flexible, effective approach to regating several hundred thin patterns. Photographs, diagrams, table. 6 ref. (E22, Cu)

260-E. The Influence of Casting Temperature on Chill and Mottle Formation. W. J. Williams. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Feb. 1954, p. 136-144 + 4 plates.

With melting temperatures above a certain value, a decrease in casting temperature decreases the chilling tendency. Additions of aluminum accentuate effect of casting temperature. Tables, photographs. 2 ref. (E25, CI)

261-E. A Cause of Cracking in Bath Castings. E. R. Evans and D. McK. Webster. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Feb. 1954, p. 145-159.

Cracking in certain cases is due to presence of abnormally high contents of antimony, boron and lead. Tables, graphs. (E25, CI)

262-E. Segregation of Manganese Sulphide Type Inclusions in Grey Cast Iron. R. Jolly. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Feb. 1954, p. 180-186 + 6 plates.

Occurrence of defects in form of mottled finish associated with small cavities observed on machined casting surface of cylinder casting. Micrographs, tables. 5 ref. (E25, M28, CI)

263-E. Shell Moulding in Action. M. J. Sargeaunt. *Machinery Lloyd (Overseas Ed.),* v. 26, Mar. 13, 1954, p. 71, 73-80.

Effect in increasing productivity, cleanliness and precision of the foundry. Photographs, tables. (E16)

264-E. Diecasting Machine With Cold or Hot Chamber Heads. *Machinery Lloyd (Overseas Ed.),* v. 26, Mar. 13, 1954, p. 103-104.

Recent developments enable good plating results and solid castings to be obtained with certainty. Photograph. (E13, Al, Mg, Zn)

265-E. Some Recent Shell Moulding Developments. *Machinery (London),* v. 84, Mar. 12, 1954, p. 563.

Method of even distribution of resin over surfaces of sand grains and its retention so a strong bond between grains can be obtained when resin is caused to flow by heating during investment and curing stages. (E16)

266-E. Better Aluminum Castings. W. D. Walther, C. M. Adams, Jr., and H. F. Taylor. *Modern Metals,* v. 10, Mar. 1954, p. 44-46.

Research project on improvement of mechanical properties in aluminum castings employs a reduced-pressure test to evaluate melt quality from standpoint of dissolved hydrogen. Photographs, table. 1 ref. (E25, Al)

267-E. Simple Shell Molding Machine. Charles Potter. *Modern Metals,* v. 10, Mar. 1954, p. 50.

Reheating is unnecessary, mold has good continuity and good production is achieved by handling hot plate quickly at dump box and ejector stations. Photograph. (E16)

268-E. Biggest Independent Die Caster. F. L. Church. *Modern Metals,* v. 10, Mar. 1954, p. 66, 68-74, 76.

Success of aluminum die castings points way to expanding sales for die casting industry in general. Graph, photographs. (E13, Al, Zn)

269-E. Aluminum Die-Castings for N1 Carrier. Ludwig Pedersen. *Bell Laboratories Record,* v. 32, Apr. 1954, p. 144-147.

Electronic circuits must be mounted in durable, inexpensive and easily maintained frames that are physically compact. Photographs. (E13, T1, Al)

270-E. Horizontal-Axis Centrifugal Casting. A. J. Gibbs Smith. *Canadian Metals,* v. 17, Apr. 1954, p. 28, 32.

Equipment and techniques for production of cast iron pipe. Photographs, diagram. (E14, CI)

271-E. Developments With Synthetic Resins in the Foundry. P. G. Pentz. *Engineering,* v. 177, Mar. 26, 1954, p. 404-405.

Furane or furfurane, a colorless liquid insoluble in water, forms resins in presence of mineral acids. It may find application as a protective surface coating on core carriers made with ordinary liquid synthetic-resin core-sand mixes. (E18)

272-E. Cost Factors in Electric-Furnace Operation. F. S. Leigh. *Foundry Trade Journal,* v. 96, Mar. 18, 1954, p. 293-296.

Melting units critically analyzed with respect to capital and operating costs, method of use and metallurgical results. Tables. (E10, CI)

273-E. Testing the Gas Content of Molten Metals. G. Ohira and V. Kondic. *Foundry Trade Journal,* v. 96, Mar. 25, 1954, p. 331-333.

Method based on principle of slowly solidifying small cylindrical casting, design of which insures good feeding during solidification. Density of cylinder found to bear direct relation to gas content of molten metal. Diagrams, graphs. 9 ref. (E25)

274-E. The Arc Melting of Metals and Its Application to the Casting of Molybdenum. G. L. Hopkin, J. E. Jones, A. R. Moss and D. O. Pickman. *Institute of Metals, Journal,* v. 82, Apr. 1954, p. 361-373 + 2 plates.

Materials, equipment and techniques. Micrographs, diagrams, photographs, graph, table. 7 ref. (E10, Mo)

275-E. Designing Small Die Castings. *Machine Design,* v. 26, Apr. 1954, p. 181-183.

Basic recommendations assure suitable design features on small parts. Diagrams. (E13)

276-E. Melting Furnaces for Copper-Based Alloys. *Machinery Lloyd (Overseas Ed.),* v. 26, Mar. 27, 1954, p. 102-103.

Melting problems overcome by new furnace using continuous melting. Metal losses and fuel costs are low. Photographs. (E10, Cu)

277-E. Casting in Semi-Permanent Ceramic Moulds. *Machinery (London),* v. 84, Mar. 19, 1954, p. 589-597.

For high-accuracy uncored castings of simple shape without flanges or re-entrant angles which may hinder free contraction during cooling. Photographs. (E19)

278-E. The Control of Production Variables in Die Casting. H. K. Barton and L. C. Barton. *Machinery (London),* v. 84, Mar. 26, 1954, p. 658-666.

Metal analysis, injection temperature and pressure, die temperature, duration of casting cycle, condition of vents, mechanical efficiency of die, frequency of die and cavity lubrication and cooling of castings. Diagrams, graphs. (E13)

279-E. Mechanized Cupola Charging Plant. *Mechanical Handling,* v. 41, Apr. 1954, p. 176-179.

Plant produces castings for cylinder blocks, heads and liners with greater efficiency. Diagram, photographs. (E10, CI)

280-E. Founding Magnesium-Base Alloys. XII. Coring. M. Caillon. *Metal Industry,* v. 84, Mar. 19, 1954, p. 232-234.

Factors to consider in core design and use. Principles for location and attachment of risers. Diagrams. (To be continued.) (E21. E22, Mg)

281-E. Founding Magnesium-Base Alloys. XIII. Design Modifications. M. Caillon. *Metal Industry,* v. 84, Mar. 26, 1954, p. 247-248.

Two examples of change in design leading to simplification of mold, reduction in set-up time and use of equipment. Diagrams. (To be continued.) (E19, Mg)

282-E. Duplexing in the Foundry. Combination of Cupola and Electric Arc Furnace. Francis J. Knight. *Metallurgia,* v. 49, no. 293, Mar. 1954, p. 137-138.

Increased production of good quality castings at reduced cost. Photographs. (E10, CI)

283-E. Casting Stainless Steel in Shell Molds. H. J. Cooper and M. L. Katz. *Metal Progress,* v. 65, Apr. 1954, p. 102-106.
Reviews shell molding of stainless steel. Shell mold process utilizes thermosetting properties of phenolic or urea resins to provide a bond for silica or zircon sand in construction of mold. Photographs. (E16, SS)

284-E. Aircraft Structural Parts Can Be Die Cast. Elmer Van Sickle. *Precision Metal Molding,* v. 12, Apr. 1954, p. 33, 133.
Landing gear wheels with high impact strength and light weight can be secured in either aluminum or magnesium die castings. Photograph. (E13, Al, Mg)

285-E. In Railway Equipment Zinc Die Castings Replace Gray Iron. W. B. Wells. *Precision Metal Molding,* v. 12, Apr. 1954, p. 36.
Conversion to zinc casting results in reduced cost and weight. Photograph. (E13, Zn, CI)

286-E. Plumbing Fittings by Die Casting. *Precision Metal Molding,* v. 12, Apr. 1954, p. 46-47, 132.
Cast threads, knurling, intersecting and tapered holes are among features obtained without extra machining costs by virtue of die casting process. Photographs. (E13)

287-E. Two New Ways to Fasten Shell Mold Halves. *Precision Metal Molding,* v. 12, Apr. 1954, p. 99-100.
New and effective technique uses special clips or fasteners. Photographs. (E16)

288-E. Tricks That Make Shell Molding Click. W. H. L. Bryce. *SAE Journal,* v. 62, Apr. 1954, p. 32-33.
Precautions designers should observe in specifying tolerances, finishes and mechanization. Drawing. (E16)

289-E. (German.) **Design of Molding Machines With Compressed-Air Drive.** J. Broberg and L. Villner. *Giesserei,* v. 41, no. 6, Mar. 18, 1954, p. 129-134.
Choice of materials, weight of machines, foundation and design from standpoint of ease of cleaning, repairing and lubricating and protection from sand. Diagrams, photographs. (To be continued.) (E17)

290-E. (German.) **Operation and Operating Data on an 800-Kg Low-Frequency Induction Crucible Melting Furnace.** H. Rohn. *Giesserei,* v. 41, no. 6, Mar. 18, 1954, p. 134-137.
Economy shown by actual melting operations. Diagram, photographs, tables. (E10)

291-E. (German.) **Flow Properties and Degree of Compressibility of Mold Materials.** K. Wittmoser. *Giesserei,* v. 41, no. 6, Mar. 18, 1954, p. 140-141.
Pressure versus degree-of-compression curves require correction for each substance examined. Graphs, table. 3 ref. (E18)

292-E. (German.) **Heat-Conducting Pipe Eliminators.** Béla Tisza. *Giesserei,* v. 41, no. 6, Mar. 18, 1954, p. 142-147.
Risers of molds for highly shrinking metals can be considerably reduced by covering their surface with insulating or exothermic pipe eliminators. Diagrams, tables, photographs. (E22)

293-E. (German.) **Sand-Contamination With Steel. Sand Spots and Scabbing in Steel Casting.** Wolfgang Kilian. *Metallurgie und Giesserei Technik,* v. 4, no. 1, Jan. 1954, p. 34-36.
Difficulties related to grain size of the sand, temperature and time. Graphs, micrograph. 8 ref. (E18, CI)

294-E. The Residual Oxygen Content of Cupola-Melted Gray Cast Iron. E. A. Loria and H. W. Lownie, Jr. *American Society for Metals, Transactions,* v. 46, 1954, p. 409-417.
Critical survey of published data on vacuum-fusion analysis of cast iron. Explains high values reported in literature. Deoxidation theory for iron and steel. Table. 8 ref. (E10, S11, CI)

295-E. Producing Titanium Alloy Castings. Marvin Glassenberg and M. J. Berger. *American Foundryman,* v. 25, May 1954, p. 107-112. (AFS Convention Preprint no. 54-35.)
Furnace for melting and casting titanium was developed. Industrially important castings were produced in zircon shell, dry silica sand and graphite molds. Photographs, diagrams, tables. 3 ref. (E10, Ti)

296-E. Gating and Risering of Magnesium Alloys. II. H. E. Elliott. *American Foundryman,* v. 25, May 1954, p. 113-122. (AFS Convention Preprint no. 54-42.)
Rejects due to contraction in passing from liquid to solid state, their causes, measures to correct them. Diagrams. 8 ref. (E22, Mg)

297-E. Pre-Mixing of Reconditioning Materials for Molding Sand. Burdette Jones. *American Foundryman,* v. 25, May 1954, p. 123-126. (AFS Convention Preprint no. 54-30.)
Premixing of sand additives results in saving of materials, better control of sand properties and a

cleaner sand conditioning department. Additions were bentonite, sea coal and wood flour or a treated cellulose. Diagram, chart. (E18)

298-E. Cupola Melting of Cast Iron Borings and Steel Turnings. W. Y. Buchanan. *American Foundryman,* v. 25, May 1954, p. 127-137. (AFS Convention Preprint no. 54-67.)

Experiences in melting comparatively finely divided cast iron and steel in cupolas. Diagrams, photographs, tables. (E10, CI)

299-E. After Three Years: Developments in Shell Molding. E. I. Valyi. *American Foundryman,* v. 25, May 1954, p. 138-143. (AFS Convention Preprint no. 54-75.)

Significant contributions to art of shell molding. Includes coating of sand, shell forming, pattern heating and curing. Photographs. (E16)

300-E. Automatic Mold Stacking. Greg Minogue. *American Foundryman,* v. 25, May 1954, p. 144-146.

New type blow-squeeze machines are push-button operated, fully automatic, one cycle operation and controlled by electric motor-driven cam timers which actuate solenoid valves. Photographs. (E19)

301-E. How to Modernize Your Foundry. Lester B. Knight. *Foundry,* v. 82, May 1954, p. 132-139.

Judicious spending to keep plants modern and to permit worker to produce the most for his efforts can increase quality, production, wages and profits. Photographs, diagrams. (E general)

302-E. Automation in the Foundry. William E. Dougherty. *Foundry,* v. 82, May 1954, p. 140-145.

Equipment, plant layout and operating procedures. Diagram, photographs. (E general, A5)

303-E. Inventory of Foundry Equipment. *Foundry,* v. 82, May 1954, p. 146-163.

Molding and coremaking, sand preparation, melting and heat treating, materials handling, cleaning and finishing. Tables. (E general, A5)

304-E. Equipment for the Small Foundry. *Foundry,* v. 82, May 1954, p. 164-197.

Molding, coremaking, sand conditioning, yard work and furnace charging, melting and pouring, shakeout and cleaning and related equipment including air compressors, heat treating ovens and exhaust and dust collection systems. Photographs, (E general)

305-E. Dermatitis Prevention in the Foundry Industry. Floyd van Atta. *Foundry,* v. 82, May 1954, p. 289 + 5 pages.

Equipment and preventative techniques. Photographs. (E general, A7)

306-E. Factors in Quoting on Aluminum Castings. E. Carrington. *Foundry,* v. 82, May 1954, p. 316 + 4 pages.

Quantity, alloy type, machining operations, heat treatment and others. (E general, A4, Al)

307-E. New Electrode Control. H. F. Arndt and R. J. Songer. *Foundry,* v. 82, May 1954, p. 325, 333.

Substantial savings in operating costs indicated through use of magnetic amplifier arc control. Photographs. (E10)

308-E. Employs Close Control in Die Casting Magnesium. Thomas A. Dickinson. *Foundry,* v. 82, May 1954, p. 339, 342, 344.

Close control of temperature variations results in substantial reduction in casting rejects. Photographs. (E13, Mg)

309-E. Blowing Machine. L. E. Hexamer and G. A. Conger. *Foundry,* v. 82, May 1954, p. 351, 354, 356.

Equipment for making shell molds and cores. Photographs. (E16)

310-E. Mechanical Handling Raises Foundry's Efficiency. Francis A. Westbrook. *Foundry,* v. 82, May 1954, p. 362, 364, 366.

Equipment, plant layout and operating techniques. (E general, A5)

311-E. Centrifugal Casting on the Continent. *Foundry Trade Journal,* v. 96, Apr. 1, 1954, p. 359-361.

Current practices in production of cast iron pipe. Photographs, diagrams. (E14, CI)

312-E. The First Half-Century in the History of the Institute of British Foundrymen. T. Makemson. *Foundry Trade Journal,* v. 96, Apr. 8, 1954, p. 379-391.

Review of organization's foundation and growth. (E general, A9)

313-E. Development of the Foundry Industry During the Past Fifty Years. V. C. Faulkner and S. H. Russell. *Foundry Trade Journal,* v. 96, Apr. 8, 1954, p. 399-418.

Progress in all sections of foundry industry during the period under review. Diagrams, photographs. (E general)

314-E. Two Methods of Moulding the Same Casting. Harold Haynes. *Foundry Trade Journal,* v. 96, Apr. 8, 1954, p. 419-422.

Machine molding and hand-ramming methods compared. Photographs. (E19)

315-E. Balanced Production of Malleable. A. R. Parkes. *Foundry*

Trade Journal, v. 96, Apr. 15, 1954, p. 437-447.

Equipment, plant layout and operating procedures. Photographs, diagrams, tables. (E11, CI)

316-E. Lower Foundry Costs Start With Part Design. Edward W. Moir. *Iron Age,* v. 173, Apr. 15, 1954, p. 128-131.

For low casting cost, high production rates and top quality avoid core designs which make foundry production difficult. Photographs, diagrams. (E21)

317-E. Improving Casting Yields. D. E. Brooks. *Iron & Steel,* v. 27, Apr. 1954, p. 131-132.

Insulating material and method of application to decrease speed of cooling of riser with respect to that of casting, thereby permitting use of smaller risers and increasing casting yields. Table. 3 ref. (E22)

318-E. The Solidification of Nodular Iron. H. Morrogh. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 378-382 + 2 plates.

Cooling-curve and quenching experiments indicate graphite nodules may form directly from liquid. Sites of decomposed carbide may be recognized by segregation of nickel. Various solidification sequences suggested. Micrographs, table, graph. 7 ref. (E25, CI)

319-E. The Growth of Nodular Graphite. M. Hillert and Y. Lindblom. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 388-390 + 1 plate.

Graphite spherulites grow by screw dislocations generated by the inclusion of foreign atoms in graphite lattice. Autoradiography shows rare earth elements to be uniformly distributed through spherulites present in a nickel-carbon alloy treated with misch metal. Photograph, diagrams, micrographs. 6 ref. (E25, CI)

320-E. Shell Mould Casting of Motor Car Parts. James H. Smith. *Machinery (London),* v. 84, Apr. 2, 1954, p. 687-694.

Machining costs pared by close tolerance casting. Casting procedure is discussed. Photographs. (E16)

321-E. Gating Technique. A. De Jong. *Metalen,* v. 9, no. 6, Mar. 31, 1954, p. 85-89.

Advantages of knock-off risers in iron and steel casting and for all types of sand casting not using aluminum in the alloy. Table, diagrams. 5 ref. (E22, CI)

322-E. Manufacture of Cast Iron Service Pipes. *Times Review of Industry,* v. 8, new ser., Apr. 1954, p. 26, 29.

Existing types of pipes, various processes employed and latest developments in manufacture. Photograph, tables. (E general, CI)

323-E. Brass Die Casting Costs Reduced With Electric Induction Furnaces. Lewis B. Reed. *Western Metals,* v. 12, Apr. 1954, p. 53-54.

Solves some problems of fuel-fired furnaces. Cleaner, thoroughly alloyed metal, no wasted time in waiting for metal to reach temperature, no shutdowns to change crucibles and satisfactory refractory life. Photographs. (E13, Cu)

324-E. (Dutch.) **Magnets Cast in Shell Molds.** J. Kuipers. *Metalen,* v. 9; *Handel en Industrie,* v. 9, no. 5, Mar. 15, 1954, p. 34-35.

Methods of shell molding as applied to magnets. Relative merits of sand casting and shell molding. Photograph, table. (E16, E11)

325-E. (German.) **Working of Zinc-Base Materials. Current-Supply Installations for Melting in Low-Frequency Induction Furnaces.** E. Bartuska and K. Köller. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben,* v. 99, no. 3, Mar. 1954, p. 41-47.

Working by noncutting methods. Design of furnace and current-supply arrangements for melting of zinc and its alloys. Photograph, diagrams. 6 ref. (E10, Zn)

326-E. (German.) **Design of Molding Machines With Compressed-Air Drive.** J. Broberg and L. Villner. *Giesserei,* v. 41, no. 7, Apr. 1, 1954, p. 153-160.

Suggested improvements for increased efficiency. Photographs, diagrams. (E19)

327-E. (German.) **Centrifugal Machines for Casting Bearings for Railway Equipment of the German Federation.** *Giesserei,* v. 41, no. 7, Apr. 1, 1954, p. 168-170.

Design and operation of Göttinger and Hall machines especially designed for lining bearings. Diagrams. (E14)

328-E. (Swedish.) **Work Simplification in Foundries.** Lars Boman. *Gjuteriet,* v. 44, no. 3, Mar. 1954, p. 35-42.

Methods of analysis and survey of stack molding unit. Diagrams, tables, photographs. (E general)

329-E. (Swedish.) **Feeding and Solidification. III. Types of Feeding and Neck Core.** K. Åkesson. *Gjuteriet,* v. 44, no. 3, Mar. 1954, p. 43-50.

Function and use of atmospheric feeders; advantages and limitations compared with ordinary risers. Neck

core materials, dimensions and position in the mold. Diagrams, table, graphs. 13 ref. (E23, E25)

330-E. Basic Lined Cupola Cuts Costs, Improves Quality. T. M. Frazell and J. D. Sheley. *Iron Age,* v. 173, Apr. 29, 1954, p. 85-88.

Lining life is increased, less refractory per ton of metal melted is used, and cheaper grades of pig iron and coke may be used. Lower sulfur contents at the spout and high manganese recovery possible. Tables, graphs, diagram. (E10, CI)

331-E. Founding Magnesium-Base Alloys. XIV. Test Bars and Patterns. XV. Running Systems. XVI. Gating. XVII. Cooling in the Mold. M. Caillon. *Metal Industry,* v. 84, Apr. 2, 1954, p. 271-272; Apr. 9, 1954, p. 285-288; Apr. 16, 1954, p. 308-309; Apr. 23, 1954, p. 328-331.

Comprehensive survey of molds and methods of pouring and chilling castings. Graphs, tables, diagrams. (E17, E22, E25, Mg)

332-E. (German.) **New Core-Molding Process.** Fritz Brunn. *Metallurgie und Giesserei Technik,* v. 4, no. 3, Mar. 1954, p. 113-116.

Use of clay-free quartz sand and water glass hardened by injection of CO_2. Tables, photographs. (E19)

333-E. (German.) **Core Making With Water Glass and Carbon Dioxide in Iron Foundry.** Fritz Naumann. *Metallurgie und Giesserei Technik,* v. 4, no. 3, Mar. 1954, p. 116-117.

Method for gray iron casting by inclusions of 10.4% used sand and 10.4% coal dust. Photographs. (E21, CI)

334-E. (German.) **Production of Chill-Mold Gray Iron Castings With Permanent Cast-Iron Molds.** Fritz Naumann. *Metallurgie und Giesserei Technik,* v. 4, no. 3, Mar. 1954, p. 118-124.

Economic use of cast iron molds for mass production in small foundries. Photographs, diagrams. (E12, CI)

335-E. (German.) **Metallurgical Principles in Development of Melting Units in Nonferrous Metal Foundry.** A. H. F. Goederitz. *Metallurgie und Giesserei Technik,* v. 4, no. 3, Mar. 1954, p. 130-136.

Suitability of various melting furnaces from economic viewpoint, design and metallurgical considerations. Diagrams, photographs. 36 ref. (E10)

336-E. (Hungarian.) **Alloyed Cast Iron Produced Without Imported Alloying Elements.** Nandor Hajto. *Ontöde,* v. 5, no. 3, Mar. 1954, p. 49-58.

Alloying of iron with manganese, aluminum and silicon as substitutes for nickel. Structures, properties and applications. Tables, charts, micrographs. 15 ref. (E25, B22, CI)

337-E. (Hungarian.) **Silicones and Their Application in the Foundry.** Ivan Lipovecz. *Ontöde,* v. 5, no. 3, Mar. 1954, p. 58-62.

Use and production of organic silicon compounds as bonding agents for molds. (E18)

338-E. (Russian.) **Experimental Manufacture of Spheroidal Graphite Chilled Iron Rolls in Hungary.** B. Korös. *Acta Technica Academiae Scientiarum Hungaricae,* v. 8, nos. 1-2, 1954, p. 36-66 + 4 plates.

Four series of tests on production methods. Micrographs, tables, diagram, graphs. 37 ref. (E11, E25, CI)

339-E. (Book.) **Densening and Chilling in Foundry Works.** Edward Longden. Griffin & Co. Ltd., 42, Drury Lane, London, W. C. 2. 28s.

Practical application of factors involved in chilling and making sound castings. Metallurgical considerations, and effects of mold materials on density in various directions. (E25)

340-E. (Book.) **Investment Casting of SAE 1040 Steel.** 22 p. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. (P11119) $0.50.

Better castings in commercial carbon steels with an improved master pattern and novel methods of pouring bismuth mold halves and joining expendable wax patterns. (E15. CI)

341-E. (Book—Italian.) **Short History of the Foundry. (Breve Storia della Fonderia).** Guglielmo Somigli. 83 p. Il. Centro Fonderia, A. I. M. 16, via della Moscova, Milan, Italy. 1000 lire.

Evolution of foundry practice from a theoretical and practical viewpoint. (E general, A2)

342-E. Running and Feeding of Sand Castings. R. W. Ruddle. *Foundry Trade Journal,* v. 96, Apr. 29, 1954, p. 489-495; disc., p. 495-497.

Technology of feeders, chills and gates. Diagrams, table. 14 ref. (E23)

343-E. Casting Stainless Steel and Other Alloys in Shell Moulds. *Machinery (London),* v. 84, Apr. 23, 1954, p. 853-861.

Equipment, patterns, dump box and processes, including curing, stripping and coremaking. Photographs. (E16, SS)

344-E. Pressure Die-Castings in Zinc Alloy. Frank G. Woollard. *Metal Industry,* v. 84, Apr. 30, 1954, p. 364-365.

Specifications, code of practice and certification scheme in Britain. Photographs. (E13, Zn)

345-E. The British Bronze and Brass Foundry Industry. W. R. Marsland. *Metal Industry,* v. 84, Apr. 30, 1954, p. 367-368.

Present practices. Photographs. (E general, Cu)

346-E. The 1954 Die Casting Program. David S. Laine. *Precision Metal Molding,* v. 12, May 1954, p. 34-36, 84-86.

Compares use of zinc and aluminum in various industries. Tables. (E13, Zn, Al)

347-E. Take a Good Look at Shell Mold Casting. William S. Thomas. *Precision Metal Molding,* v. 12, May 1954, p. 44-45, 101-102.

Eleven advantages to expect from castings. Materials, equipment and methods used. Photograph. (To be continued.) (E16)

348-E. Alloy Steel Castings. John M. Quinn. *Product Engineering,* v. 25, May 1954, p. 129-131.

Cooperation between designer and foundry engineer emphasized. Photographs. (E general, AY)

349-E. (French.) **Improving Permeability of Fine Sand by Addition of Large-Grain Sand.** Pierre Nicolas. *Fonderie,* 1954, Mar. no. 98, p. 3872-3873.

Brief statistical study shows inadvisability of additions. Tables, charts. (E18)

350-E. (French.) **Practical Advice to Foundrymen.** *Fonderie,* 1954, Mar., no. 98, p. 3874-3877.

Deoxidation of cast iron, recovery of metallic wastes contained in molding sand in the copper alloys foundry and types of bronze usable in food industry. Magnetic cast iron. Diagrams. (E general, CI)

351-E. (German.) **Plant Experiences With Hot-Blast Cupola Furnace of Esslingen Design.** H. Kopp. *Giesserei,* v. 41, no. 8, Apr. 15, 1954, p. 186-193.

Advantages of hot blast melting utilized without preheating. High efficiency, shown by waste gas tests and lower coke consumption, improves quality. Diagrams, photographs, table, graphs. 9 ref. (E10, CI)

352-E. (German.) **Three Years of Cast Iron With Spherical Graphite in Western Germany.** Kurt Figge. *Giesserei,* v. 41, no. 8, Apr. 15, 1954, p. 193-198.

Data on melting furnaces, materials, magnesium process, properties and uses. Shows spheroidal cast iron can be produced economically. Tables, photographs, graphs, micrographs. 7 ref. (E11, CI)

353-E. (German.) **Pressure Casting by Compressing the Molten Metal Die.** K. Wittmoser. *Giesserei,* v. 41, no. 8, Apr. 15, 1954, p. 205.

Design and operation of highly efficient and accurate pressure casting mold. Diagram. 2 ref. (E13)

354-E. (German.) **Computing Dimensions of Down Gate and Sprue Cup.** *Giesserei,* v. 41, no. 8, Apr. 15, 1954, p. 207-208.

Simplified method for design. Diagrams. (E22)

355-E. (German.) **Production of Switch Boxes by Chill-Mold Aluminum Casting.** *Giesserei,* v. 41, no. 8, Apr. 15, 1954, p. 208-209.

Three chill mold designs for casting to close specifications. Diagrams. (E12, Al)

356-E. (German.) **Cerium-Cerium Alloys and Cerro Alloys.** Bruno Waeser. *Werkstoffe und Korrosion,* v. 5, no. 4, Apr. 1954, p. 137-138.

Use of cerium in production and working of spheroidal cast iron as a protective agent and catalyst. Properties of Cerrobase, Cerrobend, Cerromatrix and Cerrotru alloys. Tables. 16 ref. (E25, EG-g, CI)

357-E. (Hungarian.) **Data on the Surface Porosity of Steel Castings.** Karoly Börzsönyi. *Ontöde,* v. 5, no. 4, Apr. 1954, p. 73-78.

Causes and possibilities of control by more careful degassing of the steel melt. 6 ref. (E25, CI)

358-E. (Hungarian.) **Industrial Results in the Production of Modified Black Malleable Cast Iron.** Janos Lajtay. *Ontöde,* v. 5, no. 4, Apr. 1954, p. 79-84.

Type of furnace, structures and application. Photographs, tables, graphs, micrographs. (E10, M26, CI)

359-E. (Hungarian.) **Silicon Esters and Their Application in the Foundry.** Ivan Lipovecz. *Ontöde,* v. 5, no. 4, Apr. 1954, p. 84-88.

Use in casting technology. Diagrams. 8 ref. (E18)

360-E. (Hungarian.) **Investigation of Some Hungarian Natural and Synthetic Sands for Magnesium Casting.** Gyula Emöd and Pal Németh. *Ontöde,* v. 5, no. 4, Apr. 1954, p. 88-94.

Properties of various mixtures of synthetic and natural Hungarian sands. Graphs, tables, micrographs. 7 ref. (E18, Mg)

361-E. (Hungarian.) **Talc as a Graphite Substitute for Mold Coating.** Imre Abaffy. *Ontöde,* v. 5, no. 4, Apr. 1954, p. 94-96.

Properties of optimum coating substances. (E19)

362-E. The Influence of Mould Factors on Casting Defects. J. H. Gittus. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Apr. 1954, p. 264-277 + 1 plate.

Effects of dimensions and composition of metal and mold on change in length of test castings during solidification. Diagrams, graphs, tables, photograph. 14 ref. (E19, CI)

363-E. Behaviour of Sand Mixtures Under Load at Room and Elevated Temperatures. R. G. Godding and R. Rew. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Apr. 1954, p. 278-295 + 4 plates.

Apparatus designed and constructed to obtain stress-strain curves on dried compression test pieces of molding sand at room and elevated temperatures. Graphs, diagrams, tables, photographs. (E18)

364-E. Foundry Uses of Carbon and Graphite. E. R. Landry. *Canadian Metals,* v. 17, May 1954, p. 28, 30, 32.

Ferrous and nonferrous foundry applications of carbon and graphite, based on singular combination of chemical, physical and electrical properties. (E general)

365-E. Foundry Practice. VI. Mould Drying and Core Baking. VII. Closing and Pouring the Moulds. W. H. Solmon and Eric N. Simons. *Edgar Allen News,* v. 33, May 1954, p. 107-108.

Industrial methods. (To be continued.) (E19, E21)

366-E. Synthetic Resins in Core-Bonding. W. Andrews. *Foundry Trade Juornal,* v. 96, May 6, 1954, p. 521-524; disc., p. 524-527.

General summary of outstanding features of resin corebinders. Graphs, table. (E18)

367-E. Steelmaking for the Steel Foundry. J. Blackburn. *Foundry Trade Journal,* v. 96, May 13, 1954, p. 549-557.

Melting units and their advantages. Processes and procedures of temperature measurement and control and pouring. Photographs, table, diagram, graph. (E10, CI)

368-E. Die Castings v. Sinterings. H. K. Barton. *Machinery (London),* v. 84, Apr. 30, 1954, p. 918-923.

Studies both processes. Graphs, diagrams, tables. (E13, H general)

369-E. Product Design for Easy Assembly. George Dittrich. *Precision Metal Molding,* v. 12, May 1954, p. 40-41.

Five zinc die castings designed so that little or no machine work is needed. Photographs. (E13, Zn)

370-E. (Czech.) **Experience With Inserts Behind Risers in Steel Castings.** Vitezslav Batek. *Slévarenstvi,* v. 2, no. 1, Jan. 1954, p. 14-17.

Design, advantages and application. Diagrams, photographs. (E22, CI)

371-E. (Czech.) **Heavy Ilgner Wheel Castings.** Vaclav Batek. *Slévarenstvi,* v. 2, no. 2, Feb. 1954, p. 46-48.

Method of casting heavy fly wheels. Shrinkage cavities and open-grain defects. Diagrams. (E11)

372-E. (Czech.) **Rammed Lining for Cupola Furnace.** Josef Kuklinek. *Slévarenstvi,* v. 2, no. 2, Feb. 1954, p. 48-50.

Economy and chemical analysis. Diagram. (E10)

373-E. (Czech.) **Chilled Cast Rolls.** Otto Necas. *Slévarenstvi,* v. 2, no. 2, Feb. 1954, p. 34-43; no. 3, Mar. 1954, p. 71-74.

Chemical composition, structure, thickness of chilled layer and surface hardness. Production methods from molding to heat treatment. Tables, graphs, micrographs, diagrams. 26 ref. (E general, J general, CI)

374-E. (Czech.) **Experiences With the Production of a 105-Ton Steel Casting Press Stand.** J. Janousek. *Slévarenstvi,* v. 2, no. 3, Mar. 1954, p. 74-81.

Production methods. Diagrams, photographs, graphs. (E11, ST)

375-E. (Czech.) **Casting of a 21-Ton Gray Iron Anvil.** Frantisek Lakomy. *Slévarenstvi,* v. 2, no. 3, Mar. 1954, p. 81-82.

Production methods, use of knock-off riser and special care of material and method of pouring. Diagrams. (E11, E22, E23)

376-E. (Czech.) **Burning-On of Molding Materials on Castings.** Lev Petrzela. *Slévarenstvi,* v. 2; *Prace Ceskoslovenského Vyzkumu Slévarenskénho,* v. 1, no. 1, Feb. 1954, p. 1-12.

Method of testing. Effect of carbon additions to sand, mold and core coatings. Evaluation of results by comparison. Diagrams, micrographs, tables. 48 ref. (E11, E19, E21)

377-E. Development of a West Coast Steel Jobbing Foundry. Herbert F. Scobie. *American Foundryman* v. 25, June 1954, p. 59-63.

Growth of foundry and production facilities. Photographs, diagram. (E general, CI)

378-E. Induction Melting With High and Low Frequency. Frank T. Ches-

nut. *American Foundryman,* v. 25, June 1954, p. 70-74.

Aids to furnace selection for particular needs. Photographs, diagram. (E10)

379-E. Olivine-Silica Molding Sands. William A. Snyder and Gilbert S. Schaller. *American Foundryman,* v. 25, June 1954, p. 75-81.

Experiments to determine if sand mixtures would soften, develop swells or fuse at interface. Photographs, tables, diagrams. 11 ref. (E18)

380-E. Experiences With Plastics in Patternmaking Practice. W. C. H. Dunn. *American Foundryman,* v. 25, June 1954, p. 82-84.

Can be used for patterns, core boxes and for coating wood patterns to achieve wear resistance. Photographs. (E17)

381-E. Foundry Facts. *American Foundryman,* v. 25, June 1954, p. 85-86.

Data sheets for calculating cupola charges. Tables. (E10, CI)

382-E. A 200-Ton Spring Balance. *Engineering,* v. 177, May 14, 1954, p. 626.

Largest spring balance in world weighs large castings for costing purposes. Diagram, photographs. (E general)

383-E. Casting Buying vs Buying Castings. Oscar P. Ketter. *Foundry,* v. 82, June 1954, p. 102 + 13 pages.

Successful relationships between producers and buyers depend on understanding. Casting purchase records. Analysis of scrap costs and causes. Table, diagram, photographs. (E general, A4, CI)

384-E. Cutting Refractory Costs in Producing Malleable Iron. Albert S. Johnson. *Foundry,* v. 82, June 1954, p. 106 + 4 pages.

Types of firebrick and wall construction for air furnaces. Diagrams, table. (E10, CI)

385-E. Solidification, Feeding Characteristics of Gray and Nodular Irons. R. P. Dunphy, C. G. Ackerlind and W. S. Pellini. *Foundry,* v. 82, June 1954, p. 108 + 13 pages.

Microfeatures of solidification and wall growth characteristics. Feeding practices, carbide blocking of feed paths and shrinkage void formation. Diagrams, graphs, photographs, radiograph. 7 ref. (E25, E23, CI)

386-E. pH Value of Molding Sands. Victor E. Zang and Gerald J. Grott. *Foundry,* v. 82, June 1954, p. 116 + 6 pages.

Better castings made by pH control of the colloid binders in molding sand. Effect of chemicals and clays. Photographs, graphs, table. 2 ref. (E18)

387-E. Pelleted Foundry Pitch. E. Brett Davies, T. F. N. Matthews and G. Smart. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. A71-A76; disc., p. A76-A78.

British practice in use of powdered coal-tar pitch in molding sand. Photomicrograph, graphs, tables, photographs. (E18)

388-E. Effect of Heat on Clays and Its Bearing on the "Life" of Clay Bonds. S. Davison and J. White. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. A79-A98; disc., p. A98-A100.

Behavior of clays at metal casting temperatures. Graphs, tables, diagram. 33 ref. (E18)

389-E. Production of Diesel-Engine Castings in Grey Iron. J. R. Charlton. *Institute of British Foundrymen. Proceedings,* v. 46, 1953, p. A131-A139; disc., p. A139-A141.

Methods of producing large castings in foundry equipped for only small castings. Photographs, tables. (E11, CI)

390-E. Effect of Pouring Conditions on Shrinkage Unsoundness in Bronze Ingots Cast in Metal, Carbon or Sand Moulds. W. T. Pell-Walpole. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. A175-A182; disc., A182-A183.

Effects of rate and temperature of pouring. Optimum rates for various conditions. (E23, Cu)

391-E. Casting Design in Relation to Production. J. H. Pearce and G. D. Whitehouse. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B1-B7.

Importance of proper design and production methods in making castings more economical and satisfactory than weldments or forgings. Photographs, drawings. (E general, CI)

392-E. Pressure-Cast Aluminium Pattern Equipment. D. H. Potts. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B8-B14; disc., p. B15-B20.

Advantages and range of types of aluminum pattern equipment. Photographs, diagram. (E17, Al)

393-E. Core-Assembly as a Production Aid to the Jobbing Founder. E. H. Beech and J. Hoyes. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B31-B45.

Practical means of increasing production and reducing foundry costs. Photographs. (E21)

394-E. Runners and Risers. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B46-B49.

Symposium including "Runners and Risers for Steel Castings", E. Daybell; "Runners and Risers for Iron Castings", P. A. Russell; and "Runners and Risers for Non-Ferrous Castings", R. W. Ruddle. (E22, CI)

395-E. Design, Installation and Operation of a Water-Cooled Cupola. J. W. Dews. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B60-B66; disc., p. B67-B68.

Reasons for adoption. Experiences with 24-in. diameter cupola running for 8-hr. melts. Drawings, photographs. (E10)

396-E. The "C" Process of Casting. M. C. Dixon and R. S. Bushnell. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B69-B78; disc., p. B78-B80.

General outline of British practice in shell molding. Photomicrographs, photographs, graph, table. (E16)

397-E. Economical Use of Metals in the Foundry. D. W. Hammond. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B81-B90; disc., p. B90-B91.

Conservation of raw materials and conversion of swarf and borings into useful metal. Tables, photographs, drawings. (E general, A8)

398-E. Grain-Refinement and Its Effect in Non-Ferrous Casting Alloys. A. Cibula. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B92-B100.

Influence of grain size on casting and mechanical properties of nonferrous alloys. Recent developments in refinement of aluminum and copper-base alloys. Photographs, graphs, micrographs. 45 ref. (E25, Q general, Al, Cu)

399-E. Mechanized Foundry for Small Blackheart Malleable Castings. J. Roxburgh. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B101-B111.

Outlines general practices and compares with production of grey iron. Diagram, photographs. (E11, CI)

400-E. Mould Reaction. R. W. Ruddle. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B112-B119; disc., p. B119-B122.

Dangers and possible benefits of mold reaction in nonferrous castings. Photographs, graphs, diagrams. 7 ref. (E19, EG-a)

401-E. Castings for the Smithy and Forge. W. S. Spenceley. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B123-B132.

Practice in producing casting for subsequent forging. Photographs. (E11, CI)

402-E. Surface Finish and Facing Sands. Roy Pell. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B133-B139; disc., p. B139-B142.

Selection and treatment of sand to produce better finish on ferrous castings. Diagrams, graph, table, photographs. (E18, CI)

403-E. Knock-Off Feeding Heads. J. R. Robinson. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. B143-B149.

Use of exothermic core compounds and the Connor block to provide easy to remove heads. Photographs. (E23)

404-E. Improved Closing Methods Cut Shell Casting Costs. M. L. Katz and S. B. Donner. *Iron Age,* v. 173, June 3, 1954, p. 113-115.

New methods of closing and securing shell molds. Thermoplastic resin wood glue satisfactory for rapid shell closing. Photographs. (E16)

405-E. Scientific Method in Industry. I. Shell Moulding. M. J. Sargeaunt. *Machinery Lloyd (Overseas Ed.),* v. 26, May 8, 1954, p. 70 + 9 pages.

Simple physical concepts can be used in analysis of most industrial processes. Advantages. Tables, graphs. (E16)

406-E. Problems and Procedures in Proving Die Casting Dies. W. M. Halliday. *Metallurgia,* v. 49, no. 295, May 1954, p. 230-234.

Importance and details of checks made. (E13)

407-E. Upgrading Strength, Quality of Aircraft Castings Needed. Alfred H. Petersen. *Western Metals,* v. 12, May 1954, p. 49-51.

Greatest future need will be for large complex castings, ferrous and nonferrous, having a uniform degree of soundness and mechanical properties approaching those of wrought metals. Table, diagrams, graph, photograph.

(E general, Q general, T24)

408-E. (Czech.) **Casting of Motorcycle Cylinders.** Ladislav Matuscik. *Slévarenstvi,* v. 2, no. 4, 1954, p. 108-113.

Various methods for securing sound castings. Photographs, diagrams, graphs, tables.
(E general, CI)

409-E. (Czech.) **Internal Casting Quality.** J. Pribyl. *Slévarenstvi,* v. 2; *Prace Ceskoslovenského Vyzkumu Slévarenskénho,* v. 1, no. 4, 1954, p. 29-36.
Importance of temperature gradient during solidification. Effect of casting design, gating, risering, and combination of molding materials. Tables, diagrams, photographs, graphs. 21 ref. (E25, E22, E19)

410-E. (German.) **Compound Lead-Bronze Casting for Maximum Strength.** F. Vollmert. *Giesserei,* v. 41, no. 9, Apr. 29, 1954, p. 232-234.
Variations of dipping process in which steel bearing sleeves are immersed into molten material and suddenly quenched. Diagrams. 3 ref. (E16, Pb, Cu)

411-E. (Book.) **European Foundries and Productivity: Some Recent Experiments and Achievements.** (Technical Assistance Mission No. 122). 168 p. 1953. Organization for European Economic Cooperation, 2, rue André-Pascal, Paris. 700 fr. H. M. Stationery Office, London. 14s.
Record of papers and discussions at First European Seminar on foundry productivity, held at Paris in Nov. 1952. Methods adopted, difficulties encountered, current trends, and improvements already introduced into European foundry industry as a result of national and international technical assistance missions sent to study American foundry productivity, and the visits made by American experts to Europe.
(E general)

412-E. (Book.) **Institute of British Foundrymen, Proceedings,** (Annual Volume), v. 46, 1953. 416 p. Institute of British Foundrymen, Saint Johns Street Chambers, Deansgate, Manchester, 3, England.
Includes 30 papers on various phases of foundry practice. Papers individually abstracted.
(E general)

413-E. (Book—Russian.) **The Repairing of Defective Castings.** N. N. Smelyakov and N. F. Kosarikov. 220 p. 1950. Government Scientific-Technical Publishing House, Moscow.
Welding, soldering, and surface treatments for steel, cast iron, and nonferrous metals.
(E general, ST, CI)

414-E. (Book—Russian.) **Steel Castings.** P. F. Vasilevski. 405 p. 1950. Government Scientific-Technical Publishing House, Moscow.
Foundry text containing no physical metallurgy, but treating technology of pattern and mold design, pouring, gating, and risering.
(E general, CI)

415-E. Casting Defects, Their Cause and Methods of Prevention. N. L. Bush. *Australasian Engineer,* 1954, Apr., p. 63-71.
Information of practical use to foundry metallurgist. Graph, photographs. 7 ref.
(E general, Fe, Cu, Al)

416-E. Fish Oils Prove Satisfactory Basic Material for Core Oils. *Canadian Metals,* v. 17, May 20, 1954, p. 28, 30.
Rising cost of linseed oil prompted investigation into use of substitutes. Fish oils satisfactory and even preferable for some foundry applications. (E21)

417-E. Running and Feeding Methods for Grey-Iron Castings. P. A. Russell. *Foundry Trade Journal,* v. 96, May 27, 1954, p. 603-604; disc., p. 604-605.
Production of sound castings.
(E23, CI)

418-E. Some Aspects of Shell-Moulding Technique. D. F. Bailey. *Foundry Trade Journal,* v. 96, June 3, 1954, p. 631-637.
Experiences in pilot plant operation. Table, graphs, photographs.
(E16)

419-E. Use of Plaster Cores for Casting Torque Converter Parts. *Machinery (London),* v. 84, May 28, 1954, p. 1126-1129.
Size and shape of oil passages formed between blades can be maintained within ±.005 in. Photographs. (E21, Al)

420-E. Founding Non-Ferrous Metals. *Metal Industry,* v. 84, May 28, 1954, p. 465-467.
Operational facilities and procedures at a particular foundry. Photographs. (E general, Cu)

421-E. (Dutch.) **Pressure Casting of Model Aluminum Plates Into Dried Gypsum Molds.** B. W. Sanders. *Metalen,* v. 9, no. 9, May 15, 1954, p. 139-144.
Advantages and differences between Dutch and American processes. Photographs, diagram.
(E13, Al)

422-E. (French.) **Investigation of Gas Absorption During Smelting in the Cupola-Furnace Considering Composition of the Charge.** Heinz Siegel. *Fonderie,* 1954, May, no. 100, p. 3947-3951.
Gas content in rough cast iron. Charts, micrographs, table.
(E10, CI)

423-E. (German.) **Gas Porosity in Castings. Gasification and Degasification of Melts.** G. Schwietzke. *Giesserei,* v. 41, no. 10, May 13, 1954, p. 254-261.

Present state of research. Graphs, tables, photographs. 29 ref. (E25, Cu, Ni, Zn)

424-E. (German.) **Wear-Resistant Gray Iron, Conditions for Its Correct Casting and Qualitative Evaluation.** Horst Ringpfeil. *Metallurgie und Giesserei Technik,* v. 4, no. 4, Apr. 1954, p. 157-163.

Methods of melting and casting various alloys for optimum wear resistance. Micrographs, graphs. 2 ref. (E10, E11, Q9, CI)

425-E. (Russian.) **Utilization of Oxygen in Melting of Low Carbon and Overheated Cast Iron.** V. A. Fuklev. *Liteinoe Proizvodstvo,* 1954, no. 2, Mar.-Apr., p. 1-3.

Amount of oxygen used depending on gas pressure and charge. Addition of 0.02 to 0.03% aluminum to reduce oxidation during casting. Table, graphs. 5 ref. (E10, CI)

426-E. (Russian.) **Mold Washes for Stainless Steel Casting.** I. R. Kriannin, A. M. Liass, V. O. Iakovlev, I. B. Kumanin and P. A. Borsuk. *Liteinoe Proizvodstvo,* 1954, no. 2, Mar.-Apr., p. 3-7.

Mixtures of sand, clay, sodium silicate, chromite and chromomagnesite. Heat resistant paint and paste for coating inside of molds. Tables, graphs. 6 ref. (E19, SS)

427-E. (Russian.) **Pressure Casting of Brass Parts for Cranes.** V. P. Migai. *Liteinoe Proizvodstvo,* 1954, no. 2, Mar.-Apr., p. 7-8.

Composition and microstructure of brass and casting method. Table, photographs, micrographs. (E13, M27, Cu)

428-E. (Russian.) **Experiments of Mechanization and Improvement of the Lost-Wax Casting Process.** N. S. Kreshchanovskii, M. L. Khenkin, N. K. Levina and M. N. Zimmering. *Liteinoe Proizvodstvo,* 1954, no. 2, Mar.-Apr., p. 8-11.

Wax composition, ceramic coating, casting method and elimination of coating from casting. Diagrams. (E15)

429-E. (Russian.) **Formation of Hot Cracks.** V. G. Liuttsau. *Liteinoe Proizvodstvo,* 1954, no. 2, Mar.-Apr., p. 16-18.

Relation between alloy composition and tendency of crack formation. Tables, diagrams, micrographs, graphs. 2 ref. (E25, Sn, Bi)

430-E. (Russian.) **Sulfur in Magnesium Treated Cast Iron.** V. R. Balinskii. *Liteinoe Proizvodstvo,* 1954, no. 2, Mar.-Apr., p. 18-19.

Quality of casting reduced by sulfur from magnesium sulfide treatment. Tables, micrograph. 3 ref. (E25, CI)

431-E. (Russian.) **Combustion of Fuel in Cupola Furnace.** A. K. Fanbulov. *Liteinoe Proizvodstvo,* 1954, no. 2, Mar.-Apr., p. 21-24.

Influence of type and size of fuel on operation of cupola. Graphs, diagrams, tables. 15 ref. (E10)

432-E. (Swedish.) **Fusion of Chaplets.** K. E. Strand. *Gjuteriet,* v. 44, no. 4, Apr. 1954, p. 63-65.

Benefits of tin coating on chaplets in fusion of carbon steel in gray iron castings. Micrographs, photographs. (E19, CI)

433-E. Drawback Method of Producing Large Compressor Castings. Charles W. Frame, Jr. *American Foundryman,* v. 26, July 1954, p. 40-44.

Equipment, materials and methods. Diagrams, photographs. (E19, CI)

434-E. Slurry System Imroves Sand, Reduces Binder Consumption. *American Foundryman,* v. 26, July 1954, p. 48-51.

Wet method of handling bonding clays for molding sands. Photographs, diagram. (E18)

435-E. Maintenance of Molding Machines. E. W. Greenlees. *American Foundryman,* v. 26, July 1954, p. 52-54.

Daily and weekly routine procedures. Photographs. (E19)

436-E. Lost Wax Process Engineered for Precision Castings. K. J. Yonker. *American Foundryman,* v. 26, July 1954, p. 55-59.

Equipment and methods for melting, preparation of molds and sprues. Photographs. (E15)

437-E. Basic Production Methods for Aluminum Pistons. *Automotive Industries,* v. 110, June 1, 1954, p. 68-69, 104.

Permanent mold method of casting thin-walled parts. Photographs, diagrams. (To be continued.) (E12, Al)

438-E. Test Bars for Copper and Aluminum Base Alloy Castings. Robert A. Colton and Donald L. Lavelle. *Foundry,* v. 82, June 1954, p. 96 + 10 pages.

Mold materials and methods for preparing Webbert and Keel block test coupons. Diagrams, table, photographs. (To be concluded.) (E19, E25, Cu, Al)

439-E. Small Foundry Is Rebuilt Into Mechanized Operation. Robert

H. Herrmann. *Foundry,* v. 82, July 1954, p. 78-82, 227-228.

Equipment and methods of small modern foundry. Photographs. (E general, CI)

440-E. Accuracy Is Essential in Casting 280 MM. Artillery Shell. Robert H. Herrmann. *Foundry,* v. 82, July 1954, p. 96-99, 234-237.

Equipment and methods in production of precision alloy steel casting. Photographs, tables. (E11, CI)

441-E. Common Sense in Cores. Warner B. Bishop. *Foundry,* v. 82, July 1954, p. 84-85, 241-243.

Producing cores that will do the prescribed job as economically as possible without wasted overhead, machinery, materials, time or labor. Graphs. (E21)

442-E. Test Bars for Copper and Aluminum Base Alloy Castings. Robert A. Colton and Donald L. Lavelle. *Foundry,* v. 82, July 1954, p. 100-105, 246-251.

Design of test bar patterns, procedure for producing test bars. Photographs, diagrams. (See also item 438-E, 1954.) (E25, Cu, Al)

443-E. Thermit Casting. John Steele. *Foundry Trade Journal,* v. 96, June 10, 1954, p. 657-661.

Abridged from paper presented to Institute of British Foundrymen in South Africa. Procedure and equipment for producing steel castings. Tables. 1 ref. (E16, CI)

444-E. Notable Scottish Foundries. *Foundry Trade Journal,* v. 96, June 17, 1954, p. 685-699.

Equipment and methods. Photographs. (E general, CI)

445-E. Blast Air Moisture Control Improves Cupola Irons. J. L. Brooks. *Iron Age,* v. 174, July 1, 1954, p. 112-113.

Dehumidifying equipment helps offset daily and seasonal changes in humidity which affect quality of irons. Micrographs, diagram, graph. (E10, CI)

446-E. The Outlook for Die Castings. David Laine. *Modern Metals,* v. 10, June 1954, p. 58-59.

Attempts to prove that there has been no large-scale substitution of aluminum for zinc in die castings. Reviews program for increasing use of die castings. Tables. (E13, T general)

447-E. Practical Experiences With Spheroidal Graphite Cast Iron. H. Gries. *Henry Brutcher, Altadena, Calif., Translation no.* 3174, 15 p. (Condensed from *Giesserei,* v. 40, no. 4, 1953, p. 93-103.)

Previously abstracted from original. See item 210-E, 1953. (E25, CI)

448-E. Technique of High-Vacuum Melting and Pouring. O. Winkler. *Henry Brutcher, Altadena, Calif., Translation no.* 3240, 21 p. (From *Stahl und Eisen,* v. 73, no. 20, 1953, p. 1261-1266, 1268.)

Previously abstracted from original. See item 649-E, 1953. (E10, C25, D8)

449-E. Centrifugal Casting of Cutting Tools. J. Doskar. *Henry Brutcher, Altadena, Calif., Translation no.* 3260, 6 p. (From *Slévarenstvi,* v. 1, nos. 1-2, 1953, p. 28-30.)

Development of centrifugally cast milling cutters to take the place of forged and machined units. Tables, photographs. 2 ref. (E14, TS)

450-E. (Dutch.) **Some Experiences With the Shellmolding Method in Casting of Magnetic Steel.** A. J. J. Koch. *Metalen,* v. 9, no. 10, May 31, 1954, p. 157-162.

Properties and advantages of Dutch "Ticanol" alloyed steel for magnet production. Types of resins used in shell molding, details of operation and results. Photographs, table. (E16, CI)

451-E. (French.) **Cupola Melting of Ferrous Materials and the Problem of Carbon in Cast Irons.** J. Pascal. *Métallurgie et la construction mécanique,* v. 86, no. 5, May 1954, p. 385 + 4 pages.

Introduction and bibliography. Table, graphs. (To be continued.) (E10, CI)

452-E. (German.) **The Application of Cement-Sand Molding and of a Special Method in Practice.** W. Fuchs. *Giesserei,* v. 41, no. 11, May 27, 1954, p. 278-283.

Applications, forming of dies, molding shop for steelwork accessories, coremaking and mixtures. Diagrams, photographs, table. (E19)

453-E. (German.) **Physical Tests in Relation to Casting and Gating Practice.** L. Frede and W. Magers. *Giesserei,* v. 41, no. 11, May 27, 1954, p. 283-288.

Pouring speed, flow characteristics in plane channels, tangential and radial flow in annular mold, filling of horizontal and inclined molds and expansion of horizontal cores. Diagrams, graph, photographs. (E23, E22)

454-E. (Hungarian.) **Experiences in Hungary and Abroad on the Production of Centrifugally Cast Cylinder Liners.** Tibor Budinszky and Jozsef Gerédi. *Ontöde,* v. 5, no. 5, May 1954, p. 97-102.

Manufacturing process and usual defects of wet and dry liners. Diagrams, tables, micrographs, graphs,

photographs. (To be continued.) (E14, CI)

455-E. (Polish.) **Casting of Magnets From Alni and Alnico Alloys.** H. Zakowa. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 1, 1954, p. 29-35.

Method for preparation of sand molds and casting. Effect of casting temperature and rate of cooling. Tables, graphs, photographs, micrographs. 4 ref. (E11, E25, SG-n)

456-E. **Engineering Research Methods and Casting Problems.** A. W. Scott. *Foundry Trade Journal,* v. 96, June 24, 1954, p. 711-719, 722.

Reviews problems in heat transfer and stress effects due to thermal, residual and external forces. Diagrams, graphs, photographs. 13 ref. (E general, Q25)

457-E. **Studies on Pin Holes in Aluminium.** G. P. Chatterjee, K. C. Shome and R. P. Ganguli. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 311-320; disc., p. 321.

Pinholes in cast aluminum and its alloys are due primarily to hydrogen which on adsorption and diffusion forms bubbles under certain definite conditions. Fundamental concepts on solution, adsorption and diffusion of hydrogen. Graphs, table. 16 ref. (E25, N1, Al)

458-E. **Distortion of Die Castings—Causes and Prevention.** H. K. Barton. *Machinery (London),* v. 84, June 25, 1954, p. 1352-1360.

Difficulties caused during ejection, core retraction or restriction of die opening. Diagrams. (E13)

459-E. **Take a Good Look at Shell Mold Casting. I.** William S. Thomas. *Precision Metal Molding,* v. 12, July 1954, p. 35, 69.

What shell molding can and cannot do, advantages and some materials used in shell mold casting. (E16)

460-E. **Designers Get Out of a Pickle With Dual-Metal Centrifugal Casting.** A. E. Schuh and M. L. Samuels. *SAE Journal,* v. 62, July 1954, p. 33-37.

Based on a technical committee report prepared for Division XXXI —Centrifugal Castings of the SAE Iron and Steel Technical Committee. Advantages of process, six case histories of use. Photographs, micrographs. (E14)

461-E. (Russian.) **Method of Repairing Casting Defects.** B. G. Ivanov. *Liteinoe Proizvodstvo,* 1954, no. 3, May-June, p. 3-5.

Method depends on technological problems, nature of defect and stage of processing. Techniques and conditions for cold electric arc welding, decorative repair and plating. Photographs. 7 ref.
(E general, K1, L general)

462-E. (Russian.) **Casting of Iron Drums in Semipermanent Molds.** A. N. Antonov. *Liteinoe Proizvodstvo,* 1954, no. 3, May-June, p. 6-9.

Economy of labor and materials, core and mold preparation, composition of mixtures and properties. Diagrams, tables. (E19, CI)

463-E. (Russian.) **Effect of Casting Technology on Strength of Cast Steel Parts.** N. M. Tuchkevich. *Liteinoe Proizvodstvo,* 1954, no. 3, May-June, p. 9-12.

Result of failure analysis permits broader use of thin-walled castings from low alloy steels. Tables, diagrams, photographs. 2 ref.
(E general, CI)

464-E. (Russian.) **Set-Up for Preheating Cupola Blast.** I. P. Petrov. *Liteinoe Proizvodstvo,* 1954, no. 3, May-June, p. 12-14.

Design and operational characteristics of recuperator before and after rebuilding. Diagrams, graphs. (E10)

465-E. (Russian.) **Mechanization of Frame Handling.** M. S. Morozovskii. *Liteinoe Proizvodstvo,* 1954, no. 3, May-June, p. 15.

Design and operation details for mechanical placement and removal of mold frames in tractor plant casting operations. Diagrams. (E19)

466-E. (Swedish.) **Maintenance of Foundry Machinery.** *Gjuteriet,* v. 44, no. 5, May 1954, p. 75-84.

Training and wage system for workers, spare parts, maintenance costs, machine cards and service schedules. Maintenance and lubrication of various foundry equipment. Photographs, diagram.
(E general, A6)

467-E. (Swedish.) **Testing Core Masses.** C. E. Gustafsson. *Gjuteriet,* v. 44, no. 5, May 1954, p. 86-88.

Effects of mixing time, water content, specific weight, baking temperature and composition on mechanical and physical properties. Graphs.
(E21, P general, Q general)

468-E. (Book.) **Non-Ferrous Foundry Metallurgy.** A. J. Murphy, editor. 500 p. 1954. McGraw-Hill Book Co., 330 W. 42nd St., New York. $12.50. (Also Pergamon Press, Ltd., 242 Marylebone Rd., London N.W. 1. 70s.)

Divided into seven sections, dealing with various aspects of melting

and solidification of nonferrous metals and alloys, their properties, testing and production in form of ingots and castings.
(E general, C general, EG-a)

469-E. Investment - Casting. *Aircraft Production,* v. 16, July 1954, p. 292-294.

Production of small, intricate parts. Technical and economic aspects. Photographs. (E15)

470-E. Risering of Nodular Iron. R. C. Shnay and S. L. Gertsman. *Canadian Metals,* v. 17, June 1954, p. 32, 34, 36-37.

Determination of maximum feeding distance using uncovered open risers. Photograph, charts. 4 ref. (E22, CI)

471-E. Shell Moulding Equipment. *Engineer,* v. 198, July 2, 1954, p. 13-14.

Description of machines for core making and blowing, and mold making and closing. Photographs. (E19, E21)

472-E. The Suppression of Dust. Prevention and Control in Foundries. *Engineering,* v. 178, July 9, 1954, p. 36-37.

Extract from "Dust Suppression in Foundries", W. B. Lawrie, presented at Summer Meeting of the Institution of Heating and Ventilating Engineers, London. Counting and sampling of particles; sources of dust; control systems; ventilation. Photographs. (E general A7)

473-E. Pinhole Porosity in Brass and Gunmetal Castings. N. B. Rutherford. *Foundry Trade Journal,* v. 97, July 1, 1954, p. 13-20.

Pinhole porosity was traced to a form of metal-mold reaction associated with the use of wheat flour as a mold dressing or sand addition. Photograph, diagrams, micrographs, tables. 2 ref. (E25, Cu)

474-E. New Casting Techniques—Precision Castings. L. M. Christensen. *Industrial Heating,* v. 21, July 1954, p. 1298 + 5 pages.

Review of permanent mold, die, and investment casting; shell molding. (E12, E13, E15, E16)

475-E. Design of Ferrous Castings. ASM Committee on Cast Metals. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 109-114.

Design principles and patterns for gray, white, malleable, and nodular cast iron and steel castings. Diagrams, photographs, tables, graph. 6 ref. (E17, CI)

476-E. Centrifugal Die Casting in Rubber Moulds. *Tin and Its Uses,* 1954, no. 30, p. 4-5.

Equipment, procedures, and applications. Photograph. (E13, Sn)

477-E. Olivine Fines for Foundry Use. William A. Snyder. *Trend in Engineering, (University of Washington),* v. 6, July 1954, p. 5-7, 32.

Properties and advantages of olivine molding sands. Table. 4 ref. (E18)

478-E. A Study of Reactions at Sand-Metal Interfaces. E. A. Rowe and R. T. Torgerson. *Trend in Engineering, (University of Washington),* v. 6, July 1954, p. 16-21, 30-32.

Changes in hardness of steel castings resulting from interfacial reactions. Structural changes which occur in the steel adjacent to the interface. Photographs, graphs, tables, X-ray diffraction pattern, micrograph. 6 ref. (E25, Q29, CI)

479-E. (French.) **Cupola Melting of Ferrous Materials and the Problem of Carbon in Cast Iron.** J. Pascal. *Métallurgie et la construction mécanique,* v. 86, no. 6, June 1954, p. 497 + 7 pages.

Variation of elements in first and second meltings. Melting of low-carbon and special irons. Tables, graphs, micrographs. 14 ref. (E10, CI)

480-E. (German.) **The Behavior of Molding Sand at High Temperatures.** P. Nicolas. *Giesserei,* v. 41, no. 13, June 24, 1954, p. 333-338.

Methods of determining heat resistance, gas evolution, susceptibility to checking, and thermal expansion. Effects of clay content, type of binder, moisture, and inclusions. Graphs, diagrams, table. (E18)

481-E. (German.) **Experiences in Cupola Operation.** Heinrich Schmidt. *Giesserei,* v. 41, no. 13, June 24, 1954, p. 346-347.

Proper operation and maintenance. Diagrams. (E10)

482-E. (German.) **Melting, Holding and Ladling Furnaces in the Light Metal Industry.** J. P. Rohn. *Metall,* v. 8, nos. 13-14, July 1954, p. 538-540.

Relative efficiency of various furnaces. Diagrams, photograph, tables. (E10, Al)

483-E. (Serbo-Croation.) **Calculating the Dimensions of the Casting System for Steel Casting.** Abduselam Sarajlic. *Rudarsko-Metalurski Zbornik,* 1954, no. 1, p. 97-104.

Formulas for casting speeds. Dimensions and shapes of sprues. Graphs, diagrams, photograph. 1 ref. (E23, CI)

484-E. Modern Malleable Iron Production and Selling. Herbert F. Sco-

bie. *American Foundryman,* v. 26, Aug. 1954, p. 32-37.

Plant modernization program provides balance between maximum quality control and production with a minimum investment. Photographs, plant layout, table. (E general, A5, CI)

485-E. Inspection and Salvage of Magnesium Castings. B. G. Harr. *American Foundryman,* v. 26, Aug. 1954, p. 39-42.

Visual examination and dimensional checking. Salvage methods including welding and peening. Impregnation of castings. Photographs. (E general, S14, A8, Mg)

486-E. Some Effects of Nitrogen in Cast Iron. II. J. W. Dawson, L. W. L. Smith and B. B. Bach. *American Foundryman,* v. 26, Aug. 1954, p. 43-49.

Treatment of molten iron with fluxed ferrocyanides, cyanamides or similar nitrogen-containing compounds. Effect of nitrogen on properties and structures of these treated irons. Photograph, micrographs, tables, graphs. 14 ref. (E25, CI)

487-E. How to Design an Exhaust System. W. W. Dodge. *American Foundryman,* v. 26, Aug. 1954, p. 50-55.

Step-by-step calculations for typical foundry exhaust system. Photographs, diagram, nomograph, tables. (E general, A5)

488-E. Foundry Facts. Standardization and Maintenance of Sand Testing Equipment. *American Foundryman,* v. 26, Aug. 1954, p. 67-68.

Care and use of balances, moisture indicators, sand rammers, permeability meters, and strength and deformation testers. (E18)

489-E. The Influence of Grain Size Distribution on Some Properties of Sand. J. H. Gittus. *British Cast Iron Research Association, Journal of Research and Development,* v. 5, June 1954, p. 318-330.

Establishes manner in which sand conducts heat from a cooling casting, pressure needed to cause penetration of sand molds by molten metals and the air permeability. Tables, graphs, diagrams. 24 ref. (E18)

490-E. Foundry Practice. VII. Closing and Pouring the Moulds. VIII. The Cast Metal. William H. Salmon and Eric N. Simons. *Edgar Allen News,* v. 33, July 1954, p. 157-158.

Includes table. (To be continued.) (E23)

491-E. Developments in Foundry Mechanization. R. J. Geitman. *Foundry,* v. 82, Aug. 1954, p. 70 + 10 pages.

Problems and steps to consider in formulating a materials handling system. Photographs, diagrams. (E general, A5)

492-E. Effect of Melting Frequency on Induction Melted Aluminum Alloys. A. Saia, S. Lipson and H. Rosenthal. *Foundry,* v. 82, Aug. 1954, p. 84 + 5 pages.

Compares properties of different alloys melted in gas-fired and electric induction furnaces. Photograph, micrographs, tables, graph. 3 ref. (E10, Q general, Al)

493-E. Floating Foundries. Jack E. Bolt and William H. Baer. *Foundry,* v. 82, Aug. 1954, p. 88-89.

U. S. Navy ships produce castings to meet maintenance, emergency and damage requirements. Photographs. (E general)

494-E. Southern Foundry Marks 65 Years of Progress. William G. Gude. *Foundry,* v. 82, Aug. 1954, p. 90 + 5 pages.

Progressive policies and modern production and marketing methods responsible for growth of Ross-Meehan Foundries, Chattanooga, Tenn. Photographs. (E general, A5)

495-E. Cupola Development. First Report of Sub-Committee T.S.43 of the Technical Council of the Institute of British Foundrymen. *Foundry Trade Journal,* v. 97, July 8, 1954, p. 47-51; July 15, 1954, p. 69-75.

Reviews British experience. Advantages and economic factors derived from water cooling the melting zone. Diagrams, tables, graphs. 17 ref. (E10, CI)

496-E. Measuring Machine Time Utilisation in the Diecasting Shop. *Mechanical World and Engineering Record,* v. 134, July 1954, p. 304-305.

System gives automatic record combined with operator's statement of reasons for change or irregularity. Photographs, table. (E13)

497-E. The "D" Process. H. W. Dietert. *Metal Industry,* v. 85, July 9, 1954, p. 23-25.

Further developments in precision casting. Diagrams. (E15)

498-E. Magnesium Parts Given Greater Protection by New Sealing Process. I. B. Herr. *Western Metals,* v. 12, July 1954, p. 61-63.

New resin formulation and impregnation method known as Mag-seal increases corrosion resistance of magnesium castings from 300 to 400%. Micrographs, photographs. (E25, Mg)

499-E. (English.) **Generalities on the Centrifugal Casting of Steel.** *Aciers Fins & Spéciaux Francais,* 1954, no. 17, June, p. 96-100.

Production and applications of tubes and hollow parts from special steels. Centrifuges used and applications. Photographs. (E14, ST)

500-E. (Swedish.) **Life of Bentonite-Bonded Molding Sands.** Olof Carlsson. *Gjuteriet,* v. 43, no. 11, Nov. 1953, p. 193-196.

Casting experiments with steel, gray iron and red brass in molding sands bonded with different types of bentonite. Photographs, graphs. 3 ref. (E18)

501-E. (Swedish.) **A Swing Table Mechanization.** T. Sundell. *Gjuteriet,* v. 43, no. 11, Nov. 1953, p. 198-199.

Swing tables to facilitate pouring of snap flask molds provide greater production, easier work, better air in the foundry and less risk of casualties. Diagram, photographs, tables. (E23)

502-E. (Swedish.) **Increase of Production in a Small Foundry.** E. Sabel. *Gjuteriet,* v. 43, no. 11, Nov. 1954, p. 200-201.

A 60% increase in production was obtained by casting after ordinary work hour, molding with cement sand for certain castings, molding out of doors and using the facilities of first-class laboratory. Photographs. (E general, CI)

503-E. The Investment Casting Process. *Precision Metal Molding,* v. 12, Aug. 1954, p. 39-41.

Description, advantages, applications and costs. Photographs. (E15)

504-E. Brass Permanent Mold Castings Cost 16% Less Than Sand Castings. H. D. Ward. *Precision Metal Molding,* v. 12, Aug. 1954, p. 48-49.

Savings and other advantages in molding a part for papermaking machine. Photographs, table, diagrams. (E12, Cu)

505-E. Factors That Affect Choice of the Proper Casting Method. Clark Sims. *Precision Metal Molding,* v. 12, Aug. 1954, p. 93-98.

Quality, quantity, space, time and human factors. Photograph. (E general)

506-E. Sealing Porous Castings. Wilson N. Pratt. *Tool Engineer,* v. 33, Aug, 1954, p. 70-72.

New types of impregnants and methods of impregnation in aircraft industry. Photographs. (E25, Al, Mg)

507-E. (German.) **The Solidification of Steel in Sand Molds With Special Consideration of the Use of External Iron Chills.** Hans Stein. *Giesserei,* v. 41, no. 15, July 22, 1954, p. 381-388.

Factors to be considered in complex castings and strength properties of steel castings and forged parts. Photographs, diagrams, graphs. 18 ref. (E25, Q23, CI)

508-E. (German.) **Inspection of Patterns.** Fr. Lamm. *Giesserei,* v.41, no. 15, July 22, 1954, p. 393-394.

Pointers on checking suitability of pattern designs to prevent defective castings. (E17)

509-E. (Hungarian.) **Problems of Power and Material of the Cupola Furnace.** Miklos Kiraly. *Ontöde,* v. 5, no. 7, July 1954, p. 145-157.

Problems arising in Hungary from necessity of economizing with raw materials, especially coke. Role of quantity of charge, size of ore lumps, blast and design of furnace. Diagrams, tables. 8 ref. (E10, CI)

510-E. (Brochure.) **Ideal Foundry in Pictures.** Her Majesty's Stationery Office, York House, Kingsway, London, England. 8s.6d.

Visual account, accompanied by brief running commentary, of those features of American foundry practice which most impressed European experts who visited the United States in 1952. (E general)

511-E. (Book.) **The Cupola and Its Operations.** 2nd Ed. 382 p. 1954. American Foundrymen's Society, 616 S. Michigan Ave., Chicago 5, Ill. $6.00.

Operations; equipment; materials; and principles related to operations. (E10)

512-E. Shell Moulds and Cores. *Automobile Engineer,* **v. 44, July 1954, p. 281-284.**

Important equipment developments. Photographs. **(E16, E21)**

513-E. More Automotive Parts by Shell Molding. Joseph Geschelin. *Automotive Industries,* **v. 111, Aug. 1, 1954, p. 52-54.**

Applications and advantages of a new shell molding variation, contour molding. Photographs. **(E16)**

514-E. Roto-Cast—a New Centrifugal Casting Process for Canada. *Canadian Metals,* **v. 17, July 1954, p. 24, 26, 28, 30.**

High-quality products result from control of melt and rate of solidification. Diagrams, micrographs. **(E14, EGa)**

515-E. Production of Small Precision Castings. The Investment or "Lost Wax" Process. *Engineering,* **v. 178, July 16, 1954, p. 79-80.**

Versatility in the use of the lost wax process. Photographs. (E15)

516-E. Dust Problems in Iron Foundries. E. Morgan and P. J. Moseley. *Foundry Trade Journal,* v. 97, July 22, 1954, p. 87-95.

Medical and chemical aspects of air-borne dusts; dust measurements including concentration, size and chemical nature; dust control methods and their efficacy. Diagrams, tables, photographs, graph. (E general, A8)

517-E. Simple Foundry Expedients Proved Worthwhile in Recent Years. J. E. O. Little. *Foundry Trade Journal,* v. 97, July 22, 1954, p. 99-103.

A collection of ideas to expedite foundry operations. Photographs, diagram. (To be continued.) (E general)

518-E. Simple Foundry Expedients Proved Worthwhile in Recent Years. J. E. O. Little. *Foundry Trade Journal,* v. 97, July 29, 1954, p. 127-130.

Practical tips on patternmaking, use of dressing stools instead of benches and construction and operation of tumbling barrel for cleaning small castings. Photographs. (E17, L10)

519-E. Casting Grey Iron in Iron Dies. *Machinery (London),* v. 85, July 30, 1954, p. 243-249.

Die-casting machine and its operation. Die-making procedures. Photographs. (E13, CI)

520-E. Gray Iron Shell Mold Castings. Kenneth Rose. *Materials & Methods,* v. 40, Aug. 1954, p. 102-104.

Advantages over sand castings include cost savings and improved quality. Photographs. (E16, CI)

521-E. Foundry Properties of Aluminium Alloy. E. Scheuer, S. J. Williams and J. Wood. *Metal Industry,* v. 85, July 23, 1954, p. 63-65.

Method for effective control of gas content to prevent cracking in castings. Graphs. (E25, Al)

522-E. How Quality Control Can Affect Casting Costs. Roland N. Laveen. *Product Engineering,* v. 25, Aug. 1954, p. 169-171.

Factors to consider in a cost analysis. Tables, diagrams. (E general, A4)

523-E. (English.) **High-Temperature Melting and Pouring of Gray-Iron Castings. II.** Ichiro Iitaka and Kazuhiko Sekiguchi. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 1-3.

Effect of pouring temperature on hardness, shrinkage, quality, specific weight and amount of evolved gases. Graphs. (E10, E23, CI)

524-E. (English.) **On Heredity of Pig-Iron. I. Effect of Gas-Bubbling Through Molten Iron.** Ichiro Iitaka and Kokichi Nakamura. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 4-6.

Effect of gas-bubbling on form, size and distribution of graphite in cast irons. Tables, micrographs. (E25, CI)

525-E. (English.) **Spheroidal Cast Iron. Adding Method of Pure Magnesium Block and Magnesium Powder Briquette.** Takaji Kusakawa. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 7-10.

Comparison of methods of adding magnesium during production of nodular iron. Diagrams, photographs, tables. (E25, CI)

526-E. (English.) **The Strength Measurement of Green Sand Molds.** Jiro Kashima and Akihiro Yaguchi. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 27-30.

Compression strength of samples made with various binders. Diagrams, tables, graphs. (E19)

527-E. (English.) **The Welding Phenomena Between Solid Steel and Molten Cast Iron.** Tsunemitsu Muraki. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 34-38.

Effect of temperature of molten metal on bonding cast iron to steel inserts. Diagrams, tables, micrographs, graphs. (E10, CI)

528-E. (French.) **Study of the Cupola Furnace. Use of Nomographs Facilitating Regulation.** Edouard Gabel. *Fonderie,* 1954, no. 102, July, p. 4019-4030.

Systematic graphic arrangement of parameters. Regulation of blast, rate of melting, etc. Graphs, photographs, diagrams, nomograph. 7 ref. (E10, CI)

529-E. (French.) **Utilization Characteristics of Sand for Molds. Green, Dry, and Synthetic Sands.** *Fonderie,* 1954, no. 102, July, p. 4051-4053.

Cohesion, permeability, plasticity, humidification, drying. Advantages and disadvantages of synthetic sand. Table. (E18, CI, Cu)

530-E. (French.) **Castings With High Silicon Content.** *Fonderie,* 1954, no. 102, July, p. 4054-4055.

Effect of silicon on properties of cast irons. Methods of introducing silicon. 8 ref. (E25, CI)

531-E. (German.) **The Present Status in the Development of the Shell-Molding Process in the German Democratic Republic.** Reinhart Grochalski. *Met-*

allurgie und Giessereitechnik, v. 4, no. 6, June 1954, p. 255-264.

Preparation of shell molds, economy and applications. Diagrams, photographs. (E16)

532-E. Some Factors Affecting Metal Penetration of Navy "M" Bronze in Cores. R. B. Fischer. *American Foundrymen's Society, Preprint no.* 54-5, 1954, 11 p.

Effect of static pressure and permeability of cores made from zircon and other sands. Photographs, tables, diagrams. (E21, Cu)

533-E. Theoretical Aspects of Oxygen in Cast Iron. B. B. Bach. *American Foundrymen's Society, Preprint no.* 54-6, 1954, 7 p.

Effects of main constituents of cast iron on oxygen content. All elements normally present (with the possible exception of phosphorus) will reduce oxygen content compared to that of pure iron. Tables, graphs. 29 ref. (E25, CI)

534-E. Improving Surface Finish on Gray Iron Castings. W. G. Parker. *American Foundrymen's Society, Preprint no.* 54-15, 1954, 5 p.

Production of smooth surfaces by using fine molding sands. Effect of grain size and distribution. Photographs, tables. 17 ref. (E18, CI)

535-E. Educating Management to a Valuable Tool. John Taylor. *American Foundrymen's Society, Preprint no.* 54-16, 1954, 4 p.

Use of standard data and job specification sheets in foundries. Examples. (E general, A6)

536-E. Application of Chills to Improving Pressure Tightness of Gun Metal (88-8-4). W. H. Johnson, H. F. Bishop and W. S. Pellini. *American Foundrymen's Society, Preprint no.* 54-21, 1954, 8 p.

Feeding range of gun metal evaluated on basis of pressure tightness developed in a bar casting at various distances from a riser. Graphs, diagrams, radiographs, micrographs. 3 ref. (E23, Cu)

537-E. Some Variables in Acid Cupola Melting. Sam Carter and Ralph Carlson. *American Foundrymen's Society, Preprint no.* 54-22, 1954, 15 p.

Effect of coke size, size distribution and quantity, air volume, and size and shape of steel scrap. Tables, graphs, 3 ref. (E10)

538-E. Segregation in Magnesium-Rare Earths—Zinc-Zirconium Alloys. H. M. Skelly and D. C. Sunnucks. *American Foundrymen's Society, Preprint no.* 54-23, 1954, 9 p.

Light areas on radiographs of castings are shown to be caused by eutectic segregation of relatively high absorption coefficient. Radiographs, micrographs, graphs. 15 ref. (E25, Mg)

539-E. Solidification of Finite Cylinders. V. Paschkis. *American Foundrymen's Society, Preprint no.* 54-31, 1954, 5 p.

Studies of liquidus and solidus isochrones. Tables, graphs. 4 ref. (E25)

540-E. Analysis of Work Content, Time, Distance and Speed at Conveyor Stations. Harry W. Bielefeld. *American Foundrymen's Society, Preprint no.* 54-33, 1954, 6 p.

Time-distance chart studies of foundry operations. Photographs, graphs, diagrams. (E general, A6)

541-E. Selection and Mulling of Synthetic Sands. C. E. Wenninger. *American Foundrymen's Society, Preprint no.* 54-34, 1954, 7 p.

Effect of size and shape of aggregate particles on properties of foundry sands. Diagrams, tables. 4 ref. (E18)

542-E. A Technique for Improving Quality of Investment Castings. D. G. McCullough, F. J. Webbere, and R. F. Thomson. *American Foundrymen's Society, Preprint no.* 54-37, 1954, 6 p.

Technique of casting water in transparent molds for study of fluid flow. Method for reproducing irregular casting shapes in cast plastic mold models. Table, photographs, graphs. (E15)

543-E. A Measured Daywork Program. L. W. Lehmann. *American Foundrymen's Society, Preprint no.* 54-39, 1954, 6 p.

Daywork standards and work loads. Tables, diagram, photograph. (E general, A6)

544-E. Risering of Nodular Iron. I. Risering Semi-Circular Plate Castings. R. C. Shnay and S. L. Gertsman. *American Foundrymen's Society, Preprint no.* 54-40, 1954, 5 p.

Determination of empirical relationships. Feeding requirements. Riser height. Micrograph, graphs, photograph, table. 11 ref. (E22, E23, Fe)

545-E. Research on Shell Molding. R. G. Powell, C. M. Adams, Jr., and H. F. Taylor. *American Foundrymen's Society, Preprint no.* 54-45, 1954, 10 p.

Factors which influence resin consumption in making shell molds studied by means of strength tests. Photographs, graphs, tables, micrographs. 7 ref. (E16)

546-E. An Incentive Plan for "Line" Supervisors. E. D. Bolden.

American Foundrymen's Society, Preprint no. 54-47, 1954, 8 p.
Principles of operation of multi-factor plan for foundries. Waste factors, activity standards and effectiveness quotients. Graphs, tables. (E general, A6)

547-E. Some Effects of Melting Furnace Atmospheres on Tensile Properties and Annealability of Malleable Iron. G. E. Kempka and R. W. Heine. *American Foundrymen's Society, Preprint no*. 54-50, 1954, 16 p.
Free oxygen in melting furnace atmosphere resulted in increased resistance to first and second stage graphitization and lowered tensile properties. Tables, photographs, graphs. (E10, Q23, J23, CI)

548-E. Investment Casting by the Frozen Mercury Process. I. R. Kramer. *American Foundrymen's Society, Preprint no*. 54-52, 1954, 3 p.
Advantages; mold preparation. Diagrams, photographs. (E15)

549-E. Zircon Sands—Occurrence and Uses in Australian Industry. Paul Markwell. *American Foundrymen's Society, Preprint no*. 54-53, 1954, 4 p.
Mineralogy, properties and foundry appliations. Tables. (E18)

550-E. Correlation of Air Furnace Bottom Temperature to Refractory and Operating Practice in a Cupola-Air Furnace Duplex System. F. W. Jacobs and E. C. Ashley. *American Foundrymen's Society, Preprint no*. 54-55, 1954, 13 p.
Practical study of variables affecting refractory bottom life in an oil-fired air furnace as related to bottom temperatures. Slag treatment and control. Tables, graphs, photographs. 1 ref. (E10)

551-E. Statistical Analysis of Factors Affecting Casting Finish. D. C. Ekey and J. E. Goldress. *American Foundrymen's Society, Preprint no*. 54-56, 1954, 8 p.
Effect of sand fineness, mold hardness, metal pressure and wood flour on surface roughness of aluminum castings. Tables, diagrams, photographs. (E18, E19, S12, Al)

552-E. Development of Cupola Melting Equipment. W. R. Jaeschke. *American Foundrymen's Society, Preprint no*. 54-49, 1954, 14 p.
Charging and weighing mechanisms, hot blast equipment, dust collectors and water cooling. Photographs, diagrams. 8 ref. (E10)

553-E. Another Look at Sand Grain Distribution. B. H. Booth and C. A. Sanders. *American Foundrymen's Society, Preprint no*. 54-59, 1954, 8 p.
Importance of control. Critical review of tests and terminology. Photographs, graphs, tables. 42 ref. (E18)

554-E. Heat Transfer of Various Molding Materials for Steel Castings. Charles Locke and C. W. Briggs. *American Foundrymen's Society, Preprint no*. 54-61, 1954, 11 p.
Chilling ability was rated by means of cooling curves of castings. Tables, photographs, graphs. 7 ref. (E25, CI)

555-E. Solidification of Various Metals in Sand and Chill Molds. F. A. Brandt, H. F. Bishop and W. S. Pellini. *American Foundrymen's Society, Preprint no*. 54-62, 1954, 7 p.
Solidification characteristics determined by thermal analysis. Photograph, diagram, tables, graphs. 6 ref. (E25)

556-E. Studies of Chill Action. E. T. Myskowski, H. F. Bishop and W. S. Pellini. *American Foundrymen's Society, Preprint no*. 54-64, 1954, 5 p.
Chills were applied to center portion of long 4 x 4-in. bars cast of 0.30% carbon steel. Resulting changes in solidification conditions determined by thermal analysis. Diagrams, graphs. 6 ref. (E25, CI)

557-E. Core Blowing Problems. John A. Mescher. *American Foundrymen's Society, Preprint no*. 54-65, 1954, 5 p.
Maintenance of boxes, reduction of set-up time and high-speed production. Photographs, diagrams. (E21)

558-E. Metal Penetration Tests on Dry Sand Cores and Core Washes. *American Foundrymen's Society, Preprint no*. 54-69, 1954, 4 p.
Prevention of metal penetration by use of silica and graphite core washes. Tables, diagrams, photographs. 2 ref. (E21)

559-E. Effect of Centrifugal Force on Structure and Mechanical Properties of Aluminum Casting Alloy C4. O. Z. Rylski, A. Couture and J. W. Meier. *American Foundrymen's Society, Preprint no*. 54-70, 1954, 11 p.
Apparatus described allows casting to solidify without turbulence under known conditions of centrifugal force and hydrostatic pressure. Above 700 r.p.m. mechanical properties exceed those of billets cast under the same conditions but without rotation. Photographs, graphs, micrographs, tables.
(E14, Q general, M27, Al)

560-E. Stress Required to Hot Tear Plain Carbon Cast Steel. U. K. Bhattacharya, C. M. Adams, Jr., and H.

F. Taylor. *American Foundrymen's Society, Preprint no.* 54-78, 1954, 11 p.

Apparatus measures stress in a steel casting cooling under conditions of hindered contraction. Tearing stresses were measured at temperatures ranging from 1700 to 2500° F. for plain carbon steels of various compositions. Graphs, diagram, photographs, tables, micrographs. 10 ref. (E25, Q25, CI)

561-E. Shell Molding Copper-Base Alloys. S. S. Brown and H. K. Worner. *American Foundrymen's Society, Preprint no.* 54-79, 1954, 4 p.

Fields where shell molding has been found to be effective in Australia. Problems of gating and feeding. Aspects of design for shell molded castings. Photographs, diagrams. (E16, E22, E23, Cu)

562-E. Cupola Fly-Ash Suppression. R. M. Ovestrud. *American Foundrymen's Society, Preprint no.* 54-82, 1954, 2 p.

Operating experience with a water curtain-type cupola dust collector system. Photographs. (E10, A8)

563-E. Experiences With the Use of a Spray Type Collector on a 72-In. Cupola. A. G. Tompkins. *American Foundrymen's Society, Preprint no.* 54-83, 1954, 4 p.

Operating characteristics, collector efficiency and air pollution tests. Diagrams, graph, photographs. (E10, A8)

564-E. Air Pollution Control Equipment for the Cupola. D. E. Gilchrist. *American Foundrymen's Society, Preprint no.* 54-94, 1954, 8 p.

Centrifugal and inertia-type dust collectors, scrubbers, bag filters and electrostatic precipitators. Waste heat recuperators. Diagrams, tables, graphs. (E10, A8)

565-E. Indirect Arc Melting of Bronze and Brass. G. C. Behrends. *Canadian Metals,* v 17, Aug. 1954, p. 22, 28.

Advantages in quality of product and low costs of operation. (E10, Cu)

566-E. Metal Pattern Production by the Shell Mold Process. Clarence R. Dutton. *Canadian Metals,* v. 17, Aug. 1954, p. 26-27.

Advantages, equipment and methods. Photographs. (E16)

567-E. Design and Operation of a Modified Cupola. F. A. Woolley. *Foundry Trade Journal,* v. 97, Aug. 5, 1954, p. 143-149.

Design and operation of electrically heated well. Improved temperature and composition control. Tables, photographs, diagram. 6 ref. (E10)

568-E. Centrifugal Die-Casting in Rubber Moulds. *Foundry Trade Journal,* v. 97, Aug. 5, 1954, p. 151-152.

Methods suitable for low melting point alloys. Photograph. (E13)

569-E. Automatic Molding Machine Lowers Foundry Handling Costs. W. G. Patton. *Iron Age,* v. 174, Aug. 12, 1954, p. 109-111.

Manual handling of bulky flasks and finished molds is eliminated by a fully automatic molding machine recently installed at Buick. Photographs, table. (E19)

570-E. "Mechanical World" Flowsheet No. 248. Shell Moulding. J. Zeelander. *Mechanical World and Engineering Record.* v. 134, Aug. 1954, p. 372-373.

Various steps in production of finished castings. (E16)

571-E. Foundry Properties of Aluminium Alloy. E. Scheuer, S. J. Williams and J. Wood. *Metal Industry,* v. 85, July 16, 1954, p. 47-49, 52.

Effects of gas content on shrinkage of die castings. Photographs, micrographs, table, diagram. 4 ref. (To be continued.) (E13, E25, Al)

572-E. White-Metalling Bearings. *Metal Industry,* v. 85, Aug. 6, 1954, p. 109-110.

Specialized production of rolling stock bearings by pressure casting. Photographs, diagram. (E13, Sn, Pb, Sb, Cu)

573-E. Take a Close Look at Investment Casting. *Steel,* v. 135, Aug. 23, 1954, p. 104-105.

Application, versatility, cost and advantages of process. Photographs. (E15)

574-E. (German.) **Prerequisites for Production of Spheroidal Graphite Cast Iron, Its Properties and Uses.** K. Löhberg. *Henry Brutcher, Altadena, Calif., Translation no.* 3173, 15 p. (Condensed from *Stahl und Eisen,* v. 73, no. 4, 1953, p. 212-218.)

Previously abstracted from original. See item 258-E, 1953. (E25, CI)

575-E. (Czech.) **Study of Some Properties of Organic Binders.** Jiri Ornst. *Slévarenstvi,* v. 2, no. 6; *Prace Ceskoslovenského Vyzkumu Slévarenského,* v. 1, no. 5, June 1954, p. 37-44.

Tests on effects of various oils, dextrin and clay combinations on casting quality. Graphs, photographs, tables. 59 ref. (E18)

576-E. (Czech.) **Inoculation of Cast Iron With Magnesium in an Autoclave.** Zdenék Hostinsky and Cestmir

Hlousek. *Slévarenstvi,* v. 2, no. 6; *Prace Ceskoslovenského Vyzkumu Slévarenského,* v. 1, no. 6, June 1954, p. 45-50.

Addition of magnesium at 1350 to 1360° C. under four to six atmospheres occurred with no boiling or spatter. Recovery of magnesium was high. Tables, graphs, diagrams, photographs, micrographs. 3 ref. (E25, CI)

577-E. (Czech.) **Pouring of Steel in Chill Molds.** Alois Sustek. *Slévarenstvi,* v. 2, No. 6; *Prace Ceskoslovenského Vyzkumu Slévarenského,* v. 1, no. 7, June 1954, p. 51-56.

Design of molds to allow for shrinkage and gas removal. Effects of mold temperature on mechanical properties of castings. Tables, graphs, photographs, micrographs, diagram, radiographs. 14 ref. (E23, Q general, CI)

578-E. (Czech.) **Hydrogen as the Cause of Porosity in Aluminum and Its Alloys.** Antonin Fiala and Zdena Tolarova. *Slévarenstvi,* v. 2, no. 6, June 1954, p. 162-167.

Vacuum extraction and additions of sulfur monochloride were used to trace formation of blow holes. Tables, graph, photographs, diagram. 6 ref. (E25, Al)

579-E. (Czech.) **Technical Foundry Development in Czechoslovakia.** Bohuslav Krizko. *Slévarenstvi,* v. 2, no. 6, June 1954, p. 167-170.

Review of status in 1945, subsequent development and future requirements. Diagram, graphs, tables. (E general)

580-E. (Czech.) **Molding of Wheels for Mine Trucks.** Vlastimil Pastor. *Slévarenstvi,* v. 2, no. 6, June 1954, p. 174-176.

Gating changes which produced sounder castings, increased production and lowered costs. Diagrams. (E22, CI)

581-E. White Collar Foundry. L. J. Bishop. *Flow,* v. 9, Sept. 1954, p. 76 + 9 pages.

Advantages of shell molding over conventional processes and automatic production of molds. Photographs, diagram. (E16)

582-E. Solving Problems in the Brass Foundry. Harold J. Roast. *Foundry,* v. 82, Sept. 1954, p. 106-107, 222, 224.

Operations to be analyzed to insure highest quality castings. Photograph. (E general, Cu)

583-E. Malleable Foundry Modernizes Facilities. Edwin Bremer. *Foundry,* v. 82, Sept. 1954, p. 108 + 9 pages.

Changes in equipment and practice. Diagram, photographs. (E general, CI)

584-E. Design and Dimensional Control for Investment Castings. R. L. Wood. *Foundry,* v. 82, Sept. 1954, p. 120 + 4 pages.

Interrelationships of casting design and dimensional accuracy. Photographs, graph. (E15)

585-E. A Plan for Productive Maintenance. Jack C. Miske. *Foundry,* v. 82, Sept. 1954, p. 122 + 5 pages.

Steps to reduce downtime and production costs. Photographs. (E general, A6)

586-E. How to Make a Casting When You Can't Get the Core Out. *Foundry,* v. 82, Sept. 1954, p. 155, 158.

Combination of casting and welding to simplify production of complex unit. (E general, K general, CI)

587-E. Modern Production of Whiteheart Malleable Iron. Jeffrey Bernstein. *Foundry Trade Journal,* v. 97, Aug. 12, 1954, p. 169-178.

Equipment and operating procedures. Coremaking, melting, control measures, inspection and annealing. Photographs, micrographs, table. (E11, J23, CI)

588-E. Cupola Development. First Report of Sub-Committee T.S. 43 of the Technical Council. E. S. Renshaw, chairman. *Institute of British Foundrymen, Paper no.* 1089, 1954, 12 p.

Developments in hot blast cupola operation, hot and cold blast operation compared, water-cooled cupolas, desulfurizing and carburizing in the basic cupola. Tables, diagrams, graphs. 17 ref. (E10, CI)

589-E. Design and Operation of a Modified Cupola. F. A. Woolley. *Institute of British Foundrymen, Paper no.* 1090, 1954, 7 p.

Normal cupola furnace, as used for continuous melting of high-duty gray iron in manufacturing automobile castings, is modified by providing auxiliary electric heating to the well. Diagram, photographs, tables. 6 ref. (E10, CI)

590-E. Cupola Practice: Second Thoughts. W. Y. Buchanan. *Institute of British Foundrymen, Paper no.* 1091, 1954, 10 p.

History of particular cupola design and recent improvements including lining life, pneumatic patching, furnace technique, methods of charging and use of spark arresters. Graph, photographs, diagrams. (E10, CI)

591-E. Theory, Economics and Practical Application of Exothermic Materials. D. V. Atterton and C. Edmonds. *Institute of British Foundrymen, Paper no.* 1092, 1954, 11 p.

Feeding of nonferrous and ferrous castings. Tables, photographs, diagrams, graph. 11 ref. (E23)

592-E. Cut Cupola Charge Costs With Fine Metal Scrap. W. M. Halliday. *Iron Age,* v. 174, Aug. 26, 1954, p. 106-108.

Enclosing borings, chips and other fine metal particles in sheet metal cans eliminates loss in the blast and by excessive oxidation. Diagram. (E10, CI)

593-E. New Die Casting Plant Features Melting, Handling Economies. G. B. Nyselius. *Iron Age,* v. 174, Sept. 2, 1954, p. 108-111.

Efficient and continuous cycle for production of zinc and aluminum die castings. Photographs, diagram. (E13, Ze, Al)

594-E. Plaster Moulds for Casting Aluminium by Pressure and Gravity. *Machinery (London),* v. 85, Aug. 20, 1954, p. 393-395.

Process, recommendation for its use. Diagrams. (E16, Al)

595-E. Cast-Weld Construction Bypasses Complications. G. L. Gibson. *Steel,* v. 135, Sept. 6, 1954, p. 96-97.

Advantages of combining welding and casting for large, complex shapes. Photographs. (E general, K general, CI)

596-E. (Dutch.) **"Metalock" on Shrinkage Cracks and Casting Defects.** *Metalen,* v. 9; *Handel en Industrie,* v. 9, no. 14, July 31, 1954, p. 122-123.

Repair method on castings with wall thickness from 8 mm. to 20 cm., where welding is often impossible. Diagrams, photographs. (E25)

597-E. (French.) **"Synthetic" Cast Iron and Its Use. Malleable Cast Iron and Nodular Cast Iron.** Marcel Guedras. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 285, 287.

Production methods. Applications. (E11, CI)

598-E. (German.) **Recent Development in the Field of Centrifugal Casting.** Hugo Dettela. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben,* v. 99, no. 7, July 1954, p. 121-132.

Centrifugal casting and factors to be considered in use of chill and sand molds. Diagrams, graphs, photographs, tables. 7 ref. (E14)

599-E. (German.) **Italian Production of Nodular Cast Iron by Means of Metallic Magnesium.** Carlo Longaretti. *Giesserei,* v. 41, no. 16, Aug. 5, 1954, p. 410-412.

Process based on development of magnesium vapors of controllable intensity in iron bath. Treatment with magnesium wire or shavings. Diagrams. (E25, CI)

600-E. (German.) **Advances in Foundry Practice in the 2nd Half of 1953.** Paul A. Heller. *Stahl und Eisen,* v. 74, no. 17, Aug. 12, 1954, p. 1081-1085.

Review of literature. Graphs. 85 ref. (E general)

601-E. Investment Casting Practice. *Aircraft Engineering,* v. 26, Sept. 1954, p. 315-316.

Current methods in England. Photographs. (E15)

602-E. Cupola Bed Practice. Donald E. Matthieu. *American Foundryman,* v. 26, Sept. 1954, p. 40-45.

Eight methods recommended for lighting-off and burning-in the coke bed. Photographs. (E10)

603-E. Carbon Dioxide Process for 'Baking' Molds and Cores. *American Foundryman,* v. 26, Sept. 1954, p. 46-49. (Translated from "Das Kohlensäure-Erstarrungsverfahren in der Giesserei". *Giesserei,* v. 40, no. 26, Dec. 24, 1953, p. 678-681.)

Previously abstracted from the original. See item 142-E, 1954. (E18)

604-E. Revised Spiral Test Relates Fluidity to Phase Diagram. W. A. Spindler, W. B. Pierce and R. A. Flinn. *American Foundryman,* v. 26, Sept. 1954, p. 56-58.

Simplified, reproducible fluidity spiral design measures metal flow and shows how fluidity of alloys is related to value of pouring temperature above the liquidus. Tables, photograph, graph, diagram. 3 ref. (E25, M24)

605-E. Largest Propellers Cast Are for Saratoga. *Bureau of Ships Journal,* v. 3, Sept. 1954, p. 6-7.

Size, alloy composition and mold details. Photographs. (E11, T24, Cu)

606-E. Foundry Quality Control. I. Allin P. Deacon. *Canadian Metals,* v. 17, Sept. 1954, p. 30, 32, 34.

Demonstrates that statistical quality control pays dividends in any foundry. Charts. (To be continued.) (E general, S12)

607-E. Get the Facts on Shell Molding. Annesta R. Gardner. *Dun's Review and Modern Industry,* v. 64, Sept. 1954, p. 40-44.

What it offers and how it's done. Photographs. (E16)

608-E. Centrifugal Method of Metallurgical Research. R. V. Riley and B. T. Gillyatt. *Foundry Trade Journal,* v. 97, Aug. 19, 1954, p. 209-217; Aug. 26, 1954, p. 237-244; disc., p. 244-248.

Constructional details of centrifuge and experimental applications with molten cast iron. Compares segregation, microstructures and cooling rates of static and centrifugally cast specimens. Diagrams, tables, micrographs, graphs, photographs. 18 ref. (E14, CI)

609-E. Ford Compaction Moulding. A. R. Parkes. *Foundry Trade Journal,* v. 97, Sept. 2, 1954, p. 255-260.

Description and advantages of a new precision casting method. Photographs, table. (E15, CI)

610-E. "Warm" Blast for Cupolas. *Foundry Trade Journal,* v. 97, Sept. 2, 1954, p. 263-264.

Description and advantages of air preheating to 250° C. Diagrams, table. 3 ref. (E10, CI)

611-E. Die-Pressing of Gutters. R. S. M. Jeffrey and J. A. Richards. *Institute of British Foundrymen, Paper no.* 1097, 1954, 11 p.

Equipment and techniques for producing low-cost gray iron eave troughs. Photographs, diagrams, micrographs, table. 3 ref. (E13, CI)

612-E. Production of Heavy Steel Castings. S. Taylor. *Institute of British Foundrymen, Paper no.* 1099, 1954, 6 p.

Techniques for producing very large castings. Diagrams, photographs, graph. (E general, CI)

613-E. How Melting Practice Affects Machinability of Malleable Iron. E. A. Loria. *Iron Age,* v. 174, Sept. 16, 1954, p. 168-170.

Prevention of ferritic edges by carbon dioxide decarburizing found to be best process. Micrographs, tables. 3 ref. (E25, G17, CI)

614-E. Better Permanent Mold Techniques Improve Casting Quality. H. E. Zahn. *Iron Age,* v. 174, Sept. 16, 1954, p. 174-175.

Production of storage battery grids. Photographs. (E12, Pb)

615-E. Casting Grey Iron in Iron Dies. *Machinery (London),* v. 85, Aug. 27, 1954, p. 450-455.

Runners and gates, and casting of various cored components. Photographs, diagram. (E22, CI)

616-E. Mechanization of Shell Moulding. A. Dunlop. *Metal Industry,* v. 85, Aug. 27, 1954, p. 163-167; Sept. 3, 1954, p. 192-193.

Basic process and recent developments in processing techniques. Tables, diagrams, graphs, photographs. 8 ref. (E16)

617-E. Castings for Aircraft. (Digest of "Casting Potentials", by Lon C. Kappel; *Aviation Age,* May-June 1954.) *Metal Progress,* v. 66, Sept. 1954, p. 152-154, 156.

Description and results of research on use of castings in aircraft. (E general, T24, Al)

618-E. Zinc: Supply Good—Uses Increasing. Ernest V. Gent. *Precision Metal Molding,* v. 12, Sept. 1954, p. 52-54, 127.

Favorable outlook for zinc alloy die castings from view point of supply, mechanical properties and low-cost casting characteristics. Photographs, diagrams. (E13, T general, Zn)

619-E. Aluminum Trend Is Toward Larger Die Castings. Carl H. Burton. *Precision Metal Molding,* v. 12, Sept. 1954, p. 55-57, 104.

New 72-in. die-casting machine opens new fields. Advantages and uses of aluminum die castings. Photographs, graph, diagram. (E13, Al)

620-E. Magnesium: Die Castings Enter the Automotive Field. E. L. Schaper. *Precision Metal Molding,* v. 12, Sept. 1954, p. 58-59, 114-115.

Fields of application, die casting procedure, finishing, advantages and future. Photographs. (E13, T21, Mg)

621-E. Battery Research Improved Lead Castings. H. E. Zahn. *Precision Metal Molding,* v. 12, Sept. 1954, p. 68-69, 72, 103-104.

Study of lead permanent mold castings used in batteries. Photographs. (E12, T10, Pb)

622-E. Plaster Casting the Light Metals. George R. Gardner. *Product Engineering,* v. 25, Sept. 1954, p. 164-168.

Casting design, mechanical properties, finishes and applicable alloys. Photographs, tables, diagram. (E16, Al, Mg)

623-E. (Dutch.) **The Nodulation of Cast Iron.** J. Kol and J. E. De Graaf. *Metalen,* v. 9, no. 15, Aug. 15, 1954, p. 237-243.

Experiments for establishing suitability of pig iron for production of nodular cast iron. Effects of increasing additions of magnesium and silicon upon the structure, mechanical properties and nodule stability. Graphs, tables. 3 ref. (E25, Q general, CI)

624-E. (German and French.) **Problems of Design and Choice of Alloys in Sand and Mold Casting of Light Metal.** E. Gautschi. *Aluminium*

Suisse, v. 4, no. 4, July 1954, p. 118-134.

Making molds by hand and machine, permanent mold casting, choice of alloy, calculation of wall thickness and nondestructive testing. Diagrams, tables, photographs. (E18, E19, E12, S general)

625-E. (German and French.) **The Casting of Aluminum in Ceramic Molds.** E. Witzig and A. Wernley. *Aluminium Suisse,* v. 4, no. 4, July 1954, p. 138-139.

Application of ceramic material containing lithium for production of molds which are not destroyed by the casting process. Photographs. (E12, Al)

626-E. (German.) **New Processes of Wet Sorting Fine Sand.** Helmut Trawinski. *Giesserei,* v. 41, no. 17, Aug. 19, 1954, p. 433-437.

New equipment for processing and sorting sands to meet any specification. Photographs, diagram, and graphs. 16 ref. (E18)

627-E. (German.) **Chemically Hardened Mold Mixtures.** St. Hajduk. *Giesserei,* v. 41, no. 17, Aug. 19, 1954, p. 439-440.

Chemical hardening with CO_2, proper and improper sectioning of core boxes and injection of CO_2 gas. Diagrams. 1 ref. (E19)

628-E. (German.) **Production of a Double-Mold Arrangement for the Side Parts of Sewing Machines.** Ch. Weiss. *Giesserei,* v. 41, no. 17, Aug. 19, 1954, p. 441-443.

Specifications for formation of plaster patterns, master lead patterns, casting in brass and production of wood patterns for match plates. Drawings. (E19)

629-E. Investment Castings. *Automobile Engineer,* v. 44, Sept. 1954, p. 367-373.

Process and range of application in repetition production of high-precision work. Photographs, table. (E15)

630-E. Sand Cooling and Dust Control. W. D. Bamford, F. M. Shaw and J. Bright. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Aug. 1954, p. 367-374 + 2 plates.

Means of determining relative degree of sand cooling obtainable from various units of foundry equipment and most effective means of cooling with a minimum dispersal of dust. Diagrams, tables, photograph. (E18, A5)

631-E. 10-Ton Capacity Holding Furnace. *Engineer,* v. 198, Sept. 17, 1954, p. 398.

Holder for molten cast iron. Photograph, diagram. (E10, CI)

632-E. Modern Design Characterizes New Fairbanks Morse Foundry. William G. Gude. *Foundry,* v. 82, Oct. 1954, p. 104 + 10 pages.

Layout and equipment in foundry for production of gray iron, brass and stainless steel castings. Photographs, flow sheet. (E general, CI, Cu, SS)

633-E. Wet Sand Reclamation. Hubert Chappie. *Foundry,* v. 82, Oct. 1954, p. 112-114.

Equipment and process for economical reclamation of foundry sand. Photographs, flow sheet, table. (E18)

634-E. The Small Foundry Can Use Modern Methods. Edwin J. Jory. *Foundry,* v. 82, Oct. 1954, p. 115, 264, 266-268.

Steps for evaluating new foundry methods. (E general)

635-E. Simple System Provides Rapid Cupola Charging. Edwin Bremer. *Foundry,* v. 82, Oct. 1954, p. 116-119.

Materials handling equipment and operation sequence. Photographs. (E10, A5, CI)

636-E. Quality Control in a Gray Iron Foundry. Lester Welty. *Foundry,* v. 82, Oct. 1954, p. 126-129.

Statistical approach to scrap control problem. Photographs, chart. (E general, S12, A8, CI)

637-E. Solving Problems in the Brass Foundry. Harold J. Roast. *Foundry,* v. 82, Oct. 1954, p. 130-131, 258-260.

Suggested remedies for typical foundry problems. (E general, Cu)

638-E. Close Tolerance Castings. Malcolm W. Riley. *Materials & Methods,* v. 40, Sept. 1954, p. 121-136.

Advantages and limitations of investment, plaster, permanent mold, die, shell mold and special sand castings to aid in selection of a metal forming method. Photographs, table. (E general)

639-E. (Book.) **Non-Ferrous Heavy-Metal Fabrication in the U. S. A.** (Technical Assistance Mission No. 79.) 258 p. 1954. Organization for European Economic Co-Operation. 2 rue André Pascal, Paris, France. 800 fr.

Report of fabrication of sheet, strip, rods, sections, tube and wire of heavy nonferrous metals and alloys. Casting and working of copper and copper alloys. (E general, F general, G general, Cu)

640-E. Open Model Gray Iron Foundry. Herbert F. Scobie. *American Foundryman,* v. 26, Oct. 1954, p. 34-41.

New Fairbanks, Morse foundry, its capacity, production and operations. Photographs, diagram. (E11, CI)

641-E. Malleable Melting Control. L. E. Emery. *American Foundryman,* v. 26, Oct. 1954, p. 42-46.

Control procedures include specifications for raw materials, construction and repair of individual melting units, maintaining constant burner angle, keeping a furnace chart and slag and furnace atmosphere observations. Photographs, tables. (E10, CI)

642-E. Conveying Core Sand. John H. Kauffman. *American Foundryman,* v. 26, Oct. 1954, p. 51-55.

The best features of batch handling and pneumatic conveying equipment can be realized by combining the two methods. Photographs, diagrams. (E18, A5)

643-E. Foundry Facts. Analysis of Casting Defects. *American Foundryman,* v. 26, Oct. 1954, p. 67-68.

Outline of causes of gray iron casting defects. Photographs, chart. (E25, CI)

644-E. Making Castings by Pushbutton. *Business Week,* 1954, no. 1310, Oct. 9, p. 130-132, 134.

Foundry operations at Eberhard Mfg. Co., Cleveland. Iron castings, averaging about 2½ lb. each, are being shaken out of a completely automatic foundry at the rate of one per second. Photographs. (E general, CI)

645-E. Foundry Practice. VIII. The Cast Metal. IX. The Molten Metal. William H. Salmon and Eric N. Simons. *Edgar Allen News,* v. 33, Sept. 1954, p. 205-206.

Compression and hardness tests, defects, refractory materials. (To be continued.) (E general, Q28, Q29)

646-E. Founding of Marine Propellers. John M. Langham. *Foundry Trade Journal,* v. 97, Sept. 23, 1954, p. 343-348; Sept. 30, 1954, p. 387-394.

Review of current methods and equipment for casting bronze propellers. Diagrams, photographs, tables, graph. (To be continued.) (E general, Cu)

647-E. Electric-Induction Furnace on Industrial Frequency for the Production of Cast Irons. Aldo Tagliaferri and Claude Barbazanges. *Foundry Trade Journal,* v. 97, Sept. 23, 1954, p. 355-361.

Reasons for replacing cupolas by induction furnaces in Italian foundries. Diagram, graphs, photographs, tables. (E10, CI)

648-E. Inexpensive Shell Molding and Coremaking Machine Handles Job Work. W. G. Patton. *Iron Age,* v. 174, Oct. 7, 1954, p. 130-132.

New simplified equipment for small foundries. Photographs. (E16, E21)

649-E. Proteus Turbine Casing Produced by Centrifugal Casting. *Machinery (London),* v. 85, Sept. 24, 1954, p. 647-652.

Steps in producing complex casting of 12% nickel and 23% chromium heat resisting steel. Photographs, diagrams. (E14, CI)

650-E. Low-Frequency Induction Heating in the Die-Casting Shop. H. K. Barton and L. C. Barton. *Machinery (London),* v. 85, Sept. 24, 1954, p. 676-685.

Construction and advantages of equipment for production of aluminum and zinc castings. Diagrams, photographs. (E13, Al, Zn)

651-E. Aluminium Pirns. *Metal Industry,* v. 85, Sept. 17, 1954, p. 230-231.

Experimental four-impression die for difficult castings. Photographs. (E13, Al)

652-E. Where Strength Is Needed Die Castings Can Be Used. *Precision Metal Molding,* v. 12, Oct. 1954, p. 35-36, 90-91.

Design factors to consider and applications of aluminum and zinc die castings. Photographs. (E13, T general, Al, Zn)

653-E. Pearlitic Malleable Iron Stakes Claims to New Jobs for Castings. Carl F. Joseph. *SAE Journal,* v. 62, Oct. 1954, p. 71-74.

Simplicity and adaptability of a casting with the strength and reliability of a forging. Castings are competitive with forgings, stampings and weldments. Photographs, tables. (E general, Q23, CI)

654-E. Giants of Iwo Jima Made by Welding Bronze Castings. Herman C. Phelps. *Welding Engineer,* v. 39, Oct. 1954, p. 36-38, 42.

Details of casting and welding of 78-ft. memorial. Photographs. (E general, K general, Cu)

655-E. (German.) **Production of Silicon Cast Iron.** Paul Holtzhaussen. *Metallurgie und Giessereitechnik,* v. 4, no. 8, Aug. 1954, p. 369-372.

Successful compositions, melting temperatures and casting methods. Photograph, tables. 2 ref. (E general, CI)

656-E. (Swedish.) **Determination of Pouring Rate and Pouring Method by the Layer Method.** Sten Forslund. *Gjuteriet,* v. 44, no. 8, Aug. 1954, p. 129-138.

Effect of pouring speed on formation of cold shuts. By comparison of quality of product with calculated rising speeds for different typical castings, values of critical rising speed are obtained from which the best pouring rate for comparable castings may be determined. Diagrams, photographs, micrographs, graphs. (E23, CI)

657-E. (Swedish.) **Standards for Exchangeable Pattern Plates in Frames.** *Gjuteriet,* v. 44, no. 8, Aug. 1954, p. 139-142.

Use of exchangeable pattern plates simplifies operation and reduces costs. Diagrams, tables. (E17)

658-E. **Gun-Placed Silica Cupola Linings.** T. E. Barlow and P. D. Humont. *American Ceramic Society Bulletin,* v. 33, Oct. 1954, p. 301-306.

A survey, including suggestions on the best method of handling the patching equipment and operating the furnaces or kilns to obtain maximum service from the refractory. Diagrams. (E10)

659-E. **Vacuum Impregnation Makes Light Metals Castings Pressure Tight.** *Modern Metals,* v. 10, Oct. 1954, p. 66.

New process completely seals microporosity in magnesium and aluminum castings. Photographs. (E25, Mg, Al)

660-E. (German.) **Lining Basic Cupola Furnaces.** Ernst Löbbecke. *Giesserei,* v. 41, no. 19, Sept. 1954, p. 477-485.

A critical review of literature on the status of development of basic and neutral refractory materials and their possible uses in cupola furnaces with and without cooling devices. Tables, graphs, photographs, diagrams. 101 ref. (E10)

661-E. (German.) **Gating as a Basis of Nondefective Casting.** A. Bockermann. *Giesserei,* v. 41, no. 19, Sept. 16, 1954, p. 492-493.

Proper and improper gating for casting different metals. Diagrams. (E22)

662-E. (Russian.) **Casting of Steel Shot.** F. T. Efimov, F. I. Mikhalev and P. G. Karpov. *Liteinoe Proizvodstvo,* 1954, no. 6, Sept., p. 1-3.

Casting operations and specially designed equipment for improved cast iron and steel shot. Advantages of latter. Photographs. (E general, CI)

663-E. (Russian.) **Casting of Permanent Magnets.** Ia. M. Dovgalevskii. *Liteinoe Proizvodstvo,* 1954, no. 6, Sept., p. 7-8.

Casting techniques and heat treatment of several alloys. Photographs, micrograph. 3 ref. (E11, J general, SG-n)

664-E. (Russian.) **Blowing of Cast Iron by Oxygen in Multichamber Receivers.** V. A. Fuklev. *Liteinoe Proizvodstvo,* 1954, no. 6, Sept., p. 14-16.

Amount of oxygen used, temperatures of metal before and after blowing, comparison of losses for one and three-chamber receivers. Diagrams, tables, graphs. 2 ref. (E10, CI)

665-E. (Russian.) **Peculiarities of the Process of Crystallization of Centrifugal Castings.** A. I. Baikov. *Liteinoe Proizvodstvo,* 1954, no. 6, Sept., p. 20-23.

Mathematical analysis accounting for exact manner of crystallization with different molds and for occurrence of flaws. Diagrams. 4 ref. (E14, N12)

666-E. **High-Frequency Induction Furnaces Boost Foundry Melting Capacity, Widen Range of Metals Handled.** W. D. Latiano. *Iron Age,* v. 174, Oct. 28, 1954, p. 95-98.

Integrated furnaces and power sources permit great flexibility in operations. Photographs. (E10, CI)

667-E. **Practical Molding Sand Control.** Frank S. Brewster. *Foundry,* v. 82, Nov. 1954, p. 102-107.

Principles and laws of sand management for improvement of foundry efficiency. Photograph, graphs, table, diagrams. (E18)

668-E. **Fundamentals of Synthetic Molding Sand.** Norman J. Dunbeck. *Foundry,* v. 82, Nov. 1954, p. 108-111.

Versatility and control techniques. Photographs. (E18)

669-E. **Naturally Bonded Molding Sand.** Richard H. Olmsted. *Foundry,* v. 82, Nov. 1954, p. 112-114.

Advantages of natural sands for foundries with limited equipment. Photograph. (E18)

670-E. **Molding Sand Use in the Gray Iron Foundry.** W. G. Parker. *Foundry,* v. 82, Nov. 1954, p. 116-121.

Properties of natural and synthetic sands and guides for selection. Graph, tables, photograph. 32 ref. (E18, CI)

671-E. **Steel Foundry Molding Sand.** John B. Caine. *Foundry,* v. 82, Nov. 1954, p. 122-125.

Specifications for various size molds, effects of sand on casting

quality. Photograph, micrographs. (E18, CI)

672-E. Molding Sand Practice in the Malleable Foundry. L. E. Emery. *Foundry,* v. 82, Nov. 1954, p. 126-129.

Physical and mechanical requirements for sand system. Photographs. (E18, CI)

673-E. Molding Sand in the Brass Foundry. William B. George. *Foundry,* v. 82, Nov. 1954, p. 130-133.

Factors in maintaining good sand systems. Photographs, graphs, tables. (E18, Cu)

674-E. Aluminum Foundry Molding Sand Use. Walter J. Klayer. *Foundry,* v. 82, Nov. 1954, p. 134-137.

Benefits of sand control. Photographs. (E18, Al)

675-E. Magnesium Molding Sand. K. J. Hopp. *Foundry,* v. 82, Nov. 1954, p. 138-139.

Moisture control most important factor. Photographs. (E18, Mg)

676-E. Layer Method for Determining Teeming Speeds and Mould Orientation for Making Steel Castings. Sten H. C. Forslund. *Foundry Trade Journal,* v. 97, Oct. 7, 1954, p. 407-411.

Flow of metal in various parts of the mold, formation of cold-shuts, critical rising speeds. Practical application of the test method. Diagrams, photographs, graphs. (To be continued) (E23, CI)

677-E. Founding of Marine Propellers. John M. Langham. *Foundry Trade Journal,* v. 97, Oct. 7, 1954, p. 413-414; disc., p. 414-416.

Includes machining, finishing and inspection. Photographs. (E general, Cu)

678-E. Fluidity of Metals and Methods of Determining Fluidity. Yu. A. Klyachko and L. L. Kunin. *Henry Brutcher, Altadena, Calif., Translation no.* 2539, 22 p. (From *Zavodskaya Laboratoriya,* v. 15, no. 10, 1949, p. 1198-1206.)

Previously abstracted from original. See item 16-E, 1950. (E25)

679-E. Sulfur Removal From Cast Iron by Treatment With Magnesium. K. I. Vashchenko, P. V. Avrinskii and B. M. Pashkovskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3386, 19 p. (From *Liteinoe Proizvodstvo,* v. 5, no. 1, 1954, p. 9-14.)

Previously abstracted from original. See item 180-E, 1954. (E25, CI)

680-E. (Czech.) **Casting of Bimetallic Bronze Parts.** Stanislav Lorenc and Milan Julina. *Slévarenstvi,* v. 2, no. 5, May 1954, p. 130-137.

Details of most frequently used methods for centrifugal castings, bearings and worm wheels. Diagrams, graph, tables, photographs, micrographs. 3 ref. (E14, Cu)

681-E. (Czech.) **Experiences With Cupolas.** Josef Plch. *Slévarenstvi,* v. 2, no. 5, May 1954, p. 144-146.

Design considerations for continuous flow of cast iron and slag. Diagrams. (E10, CI)

682-E. (Dutch.) **The CO_2 Hardening Process for Molds and Cores.** A. De Jong. *Metalen,* v. 9, no. 18, Sept. 30, 1954, p. 290-292.

Theory, practical method, properties of CO_2 cores, costs, advantages and disadvantages. Tables. 3 ref. (E19, E21)

683-E. (French.) **Contribution to the Study of the Problem of Removal of Dust From Cupola Gases.** Jean Prat. *Fonderie,* 1954, no. 104, Sept., p. 4147-4150.

Characteristics of cupola gases and suspended dusts. Tables, graphs, diagram. (E10, A8)

684-E. (French.) **Standard for Preparing A-S13 and Neighboring Alloys.** *Fonderie,* 1954, no. 104, Sept., p. 4151-4156.

Sand and chill casting standards for silicon cast iron. (E11, CI)

685-E. (French.) **Gravity Die Casting of Light Alloys.** Henry Garnier. *Revue de l'Aluminium,* v. 31, no. 212, July-Aug. 1954, p. 251-256.

Process and economic aspects of the method, and resultant effects on mechanical properties of the metal. Diagrams, photographs. (To be continued.) (E13, Q general, Al)

686-E. (German.) **Problems of Handling Molding Sand.** Karl Roesch. *Giesserei,* v. 41, no. 20, Sept. 30, 1954, p. 514-515.

Effect of heating on molding sand and clay, recovery of old sand by cooling and dedusting. Graphs, diagrams, photograph. 10 ref. (E18)

687-E. (German.) **On the Use of Exothermic Gate Inserts for Nodular Cast Iron.** Helmut Timmerbeil. *Giesserei,* v. 41, no. 20, Sept. 30, 1954, p. 519-521.

Thermite inserts improve quality and reduce relative size of the gate. Diagrams, micrographs. 1 ref. (E25, CI)

688-E. (German.) **On the Fluidity of Cast Iron and Its Testing.** Leo Hütter. *Giesserei,* v. 41, no. 20, Sept. 30, 1954, p. 528-534.

Review of literature, correlation between flow properties, viscosity and melt composition. Diagrams, graphs. 45 ref. (E25, CI)

689-E. (German.) **Combustion Processes in the Shaft Furnace, Especially in the Cupola Furnaces, Until the Oxygen Is Consumed.** Hans Schiffers. *Giesserei,* v. 41, no. 20, Sept. 30, 1954, p. 535-540.

Simultaneous formation of CO and CO_2 by a complex system of reactions, the law of combustion derived from the law of mass effect. Graphs, diagram. 14 ref. (E10, CI)

690-E. (Book.) **Modern Foundry Practice.** E. D. Howard, Ed. 384 p. 1954. Odhams Press, Long Acre Lane, London W.C.2. 12s 6d.

A symposium by various authors on most aspects of foundry practice. Ferrous and nonferrous materials. (E general)

SECTION F

PRIMARY MECHANICAL WORKING

1-F. Fabricators Install Extrusion Presses for Quick Service. W. G. Patton. *Iron Age,* v. 172, Nov. 5, 1953, p. 165-167.

Equipment and processes resulting in lower material costs and better quality control. Photographs, diagram. (F24, Al)

2-F. Cold "Rocking" Answers Design, Production Problems. K. W. Donle. *Iron Age,* v. 172, Nov. 5, 1953, p. 172-175.

Advantages of cold forging process including wide applications, improved mechanical properties, close dimensional control, superior surface finish and reduction in material requirements. Diagrams, photographs, table. (F22)

3-F. Roll-Design Research as Applied to Rolling-Mill Development. Bernard Robinson and W. A. Lugar *Iron and Steel Institute, Journal,* v. 175, Oct. 1953, p. 183-197.

Numerous points of roll design that should be studied and resolved before schemes for new rolling mills are developed. Tables, diagrams, graphs. 6 ref. (F23)

4-F. Manipulating Equipment, Guides, Guards, and Strippers for Rolling Mills. W. Bailey. *Iron and Steel Institute, Journal,* v. 175, Oct. 1953, p. 198-213.

Representative selection of equipments and their applications with examples taken from some recently installed blooming, slabbing and finishing mills. (F23)

5-F. Maximum Production on Hot Strip Mill. John E. Angle. *Blast Furnace and Steel Plant,* v. 41, Nov. 1953, p. 1289-1294, 1311.

Construction of mill, organization of personnel and scheduling of operations. (F23, CN)

6-F. Rolls and Rolling. XXXVII. Tie Plates. *Blast Furnace and Steel Plant,* v. 41, Nov. 1953, p. 1313-1321.

Detailed instructions for rolling various types of rail tie plates. (F23)

7-F. Five-Step Cold Extrusion Line Forms 60-Mm. Mortar Shells. Ernest Olsen. *Iron Age,* v. 172, Nov. 19, 1953, p. 147-150.

Five cold extrusion presses form a complete line for forming shells without aid of other processing methods. Photographs. 4 ref. (F24, CN)

8-F. CF&I Opens Streamlined Tube Mill at Pueblo, Colo. *Journal of Metals,* v. 5, Nov. 1953, p. 1427.

Equipment, plant layout and operating procedures. Photographs. (F26)

9-F. Planetary Hot Rolling Mill. *Metal Industry,* v. 83, Oct. 1953, p. 339.

Mill, essential feature of which is that work rolls are of small diameter arranged in a planetary system around the circumference of the backup rolls. Photograph. (F23)

10-F. The Rolling of Metals and Alloys. I. Historical Development of the Rolling Mill. Eustace C. Larke. *Sheet Metal Industries,* v. 30, no. 319, Nov. 1953, p. 989-998.

Types and uses of mills dating back to the 19th century. Diagrams, photographs. 10 ref. (To be continued.) (F23)

11-F. Large Pressure Vessel Forgings. A. A. Munro. *Times Review of Industry,* v. 7, new ser., Nov. 1953, p. 28-30, 33.

Composition and properties of the steels used and details of the forging operation. Photographs, tables. (F22, Q general, P general, AY)

12-F. (German.) **Roll Size Effects in Cold Rolling of Metal Sheets and Strips.** A. Geleji. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 1-2, 1953, p. 217-223.

Lessening resistance to rolling encountered with smaller diameter work rolls. The flattening of rolls can be calculated with help of the formula of resistance to working and of the Herz formula of flattening of rolls pressed against each other. Diagrams. 5 ref. (F23)

13-F. Symposium on Heavy Presses for Light-Metal Forgings and Extrusions. *ASME, Transactions,* v. 75, Nov. 1953, p. 1481-1533; disc., p. 1534-1542.

Includes "Introduction", J. C. Ward, Jr.; "Requirements for Large Light-Metal Forgings and Extrusions in the Aircraft Industry", C. W. Papen; "Design and Construction of Large Forging and Extrusion Presses for Light Metals", M. D. Stone; "Metallurgy and Production of Suitable Aluminum-Alloy Ingots for Large Forgings and Extrusions", T. L. Fritzlen; "Large-Forging-Press Operations and Production Problems", G. W. Motherwell, J. R. Douslin and A. L. Rustay; and "Large-Extrusion-Press Operations and Production Problems", T. F. McCormick. (F22, F24, EG-a)

14-F. Continuous Production of Improved Gautier Rail Anchors at Mid-West Forging & Manufacturing Co. *Industrial Heating,* v. 20, Nov. 1953, p. 2174, 2176, 2178, 2180, 2330.

Forming and heat treating operations. Photographs, diagrams. (F general, G general, J general, CN)

15-F. Continuous Automatic Processing Line for Beryllium Coils and Rods Placed in Operation. *Industrial Heating,* v. 20, Nov. 1953, p. 2188.

A new design continuous processing line for beryllium coils and rods has just been completed and started into production at the plant of Beryllium Corp. of America, Reading, Pa. Photographs. (F28, F27, Cu)

16-F. Bigger Slabs Answer Strip Demands. *Steel,* v. 133, Nov. 23, 1953, p. 92, 94.

45 x 90-in. universal slabbing mill accommodating ingots up to 20 tons in weight. Photographs. (F23)

17-F. Super-Thin Strip. Rolling It Is Only Half the Job. *Steel,* v. 133, Nov. 16, 1953, p. 132-133.

Operation of a modern mill, including electric drives, air conditioning, hydraulics, electronic gaging and precision grinding. Photographs. (F23)

18-F. High-Speed Welding of Nonferrous Tubing. *Welding Journal,* v. 32, Nov. 1953, p. 1098-1099.

Mills for high-speed conversion of coiled nonferrous strip into welded tubing. Photographs. (F26, EG-a)

19-F. Unique Rolling Mill Has Ingenious Equipment; Rolls Bar Shapes, Strip to Order. Robert T. Reinhardt. *Western Metals,* v. 11, Nov. 1953, p. 66-67.

Equipment, plant layout and operating procedures. Photographs. (F23)

20-F. Fine Tungsten and Molybdenum Wire for Electron Tubes. II. Its Application and Manufacture. C. C. Gee. *Wire Industry,* v. 20, Nov. 1953, p. 1075, 1077-1078, 1080, 1083.

Details of manufacturing and testing procedures involved in mass production of wire. Diagrams, photographs. (F28, T1, W, Mo)

21-F. Stainless Steel Wiredrawing Through Diamond Dies. W. F. G. Kerley. *Wire Industry,* v. 20, Nov. 1953, p. 1095-1096, 1099-1100, 1103, 1106, 1113.

Problems and techniques of the process. General discussion of diamonds; their origin, physical properties and crystallography. Die mounting, repolishing and lubricating. Photographs, diagrams, graph, table. (F28, SS)

22-F. (German.) **Model Experiments Made to Explain Flow Processes in Soaking Pits.** Michael Hansen, Hans Scholz and Oskar J. Stebel. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct., 1953, p. 375-381.

Flow of gases in different furnace pit designs and practical observations. Graph, table, diagrams, photographs. 6 ref. (F21)

23-F. (German.) **Measurements and Controls in Modern Cold-Strip Mills.** Joseph Billigmann. *Stahl und Eisen,* v. 73, no. 22, Oct. 22, 1953, p. 1394-1404.

Present status and importance of measuring and controlling rolling speeds, pressures and thicknesses of strips for increased efficiency. Graphs, tables, diagrams. 47 ref. (F23, S14, S18)

24-F. (German.) **Suitable Drives for Cold-Rolling Spools.** W. Eberhard Baltz. *Stahl und Eisen,* v. 73, no. 22, Oct. 22, 1953, p. 1404-1409.

Problems of automatic accelerating and braking of spools. Diagrams. 5 ref. (F23)

25-F. (German.) **Energy Consumption in Cold Forging on a Double-Thrust Press.** Rudolf Kellermann and Kurt Alsen. *Stahl und Eisen,* v. 73, no. 22, Oct. 22, 1953, p. 1410-1418.

A calorimetric method for measuring pressures of high-speed forging processes. Method is not suitable for measuring pressures required to forge complex shapes. Graphs, photographs, table, diagrams. (F22)

26-F. (German.) **Determining Rolling Pressure and Energy With Nomograms.** Werner Lueg. *Stahl und Eisen,* v. 73, no. 22, Oct. 22, 1953, p. 1426-1428.

Nomograms and their use. Graphs, table. 2 ref. (F23)

27-F. (Polish.) **Determining Approximate Forces and Work During Free Forging.** Jerzy Czarny. *Hutnik,* v. 20, no. 10, Oct. 1953, p. 212-216.

Calculations for determining work of forge hammers. Diagrams, graphs. 7 ref. (F22)

28-F. (Russian.) **Formability of Structural Low-Alloy Steel at High Temperatures.** S. I. Gubkin, V. G. Osipov and A. N. Danil'chenko. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 6, June, p. 910-917.

Positive formability determined in range of 20 to 1300° C. Optimal temperature zone for forging and rolling lies in the 900 to 1200° C. range. As the deforming volume increases at 800° C., deformation resistance decreases. Graphs, micrographs. 6 ref. (F22, F23, AY)

29-F. The Computation of Loads in Metal Strip Rolling by Methods Involving the Use of Dimensional Analysis. Maurice Cook and R. J. Parker. *Institute of Metals, Journal,* v. 82, Nov. 1953, p. 129-140.

Calculated load values were found to be in good agreement with measured results for conditions where ratio of initial strip thickness to roll diameter was greater than about 1:200, but when the ratio was less than this value computed data were not so accurate. Graphs, diagrams, tables. 11 ref. (F23)

30-F. Forged Tools. *Iron & Steel,* v. 26, Dec. 1953, p. 545-550.

Rolling mills, forges and heat treating facilities for making forks, shovels and axes. Photographs, diagrams. (F23, F22, J general)

31-F. Flying Shears for Billet, Bar and Rod Mills. J. H. Hitchcock and E. S. Murrah. *Iron and Steel Engineers,* v. 30, Nov. 1953, p. 80-87; disc., p. 87-90.

Types, operation and performance. Photographs, graphs. 5 ref. (F29)

32-F. Low Frequency Induction Coils Shorten Billet Heating Time. *Iron and Steel Engineer,* v. 30, Nov. 1953, p. 130, 132.

Experimental furnace and its operation. Photographs. (F21, ST)

33-F. Blooming Mill Built for Detroit Steel. *Iron and Steel Engineer,* v. 30, Nov. 1953, p. 140, 144, 146, 150.

Two-high, reversing, high-lift 44x110-in. slab blooming mill. Photographs. (F23, ST)

34-F. Versatile Hot Rod Mill. *Metal Industry,* v. 83, Nov. 20, 1953, p. 417-419.

Installation designed to roll wide variety of alloys. Photographs, diagrams. (F23)

35-F. Hot Rolling of Steel Strip. Planetary Mill Installed at Willenhall. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 247-248.

Equipment, plant layout and operating procedures. Diagrams, photographs. (F23, CN)

36-F. Mechanical Working. I. Co-Operative Research in Metal Working. W. C. F. Hessenberg. **II. Roll Force Measurement and Automatic Gauge Control.** W. C. F. Hessenberg. **III. The Study of High-Speed Wire Drawing. Problems of Heat Lubrication.** J. G. Wistreich. **IV. Some Aspects of Theoretical Plasticity.** A. P. Green. **V. Forging Research. Use of Plasticine Models.** P. M. Cook. *Metal Treatment and Drop Forging,* v. 20, Nov. 1953, p. 525-550.

Developments in research conducted by the BISRA. Graphs, diagrams, photographs. 26 ref. (F general, A9)

37-F. Britain's Biggest Aluminum Fabricator. *Modern Metals,* v. 9, Nov. 1953, p. 72-74, 76, 78, 80, 82.

A general description of facilities of the Aluminum Co. of Canada, Ltd. Includes furnace installations, foundries, forging operations, sheet mills, rolling mills, extrusion operations, and powder production. Photographs. (F general, C general, H general, Al)

38-F. Bar Mill Built to Serve Market. Allen G. Gray. *Steel,* v. 133, Dec. 7, 1953, p. 196-197, 199.

Mill for cold drawing of bars. Photographs, plant layout, diagram. (F27, ST)

39-F. German Research in Drop Forging. Otto Kienzle. *Steel Processing,* v. 39, Nov. 1953, p. 563-568.

Equipment, tolerances and wear. Photographs, diagrams, graphs. (F22)

40-F. Steam-Hydraulic vs. Hydraulic Forging Press. Victor Tatarinov. *Steel Processing,* v. 39, Nov. 1953, p. 581.

Compares efficiency of two 600-ton presses. (F22)

41-F. Forging Capacity of Hammers. K. Lange. *Steel Processing,* v. 39, Nov. 1953, p. 594-596.

Experiments to determine accuracy with which forging capacity of hammers can be estimated by the

upsetting of lead cylinders. Graphs, photograph. 2 ref. (F22)

42-F. (French.) **The "Aptitude to Swaging" of Sheet Metal. I. A New Swaging Test. The "P. V. I." Test. Its Relation With the Rational Traction Test.** Pierre Vauthier. *Metaux, Corrosion-Industries,* v. 28, no. 339, Nov. 1953, p. 437-459.
Includes tables, graphs, diagrams. (F25)

43-F. (German.) **The Determination of Rolling Time for Different Steel Grades as a Basis for Reference Ton Accounting in the Rolling Mill by Means of an Automatic Recording Instrument.** Friedrich Bleimann. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1468-1472.
Use for compilation of steel grades according to rolling difficulties. Photographs, tables, graphs. (F23, ST)

44-F. (Russian.) **The Phenomenon of Spontaneous Appearance of Facets on Wires of Polycrystalline Metals During Stretching.** P. D. Novokreshchenov. *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 123-124.
Importance in wiredrawing especially at temperatures near recrystallization point. Table, graph. (F28, Cu, Zn, Cd, Sn)

45-F. (Swedish.) **Development Trends in Forging Technique. I. Heavy Forging by Hammers and Presses.** J. M. Schenström. **II. Drop Forging.** Bengt Lagercrantz. *Jernkontorets Annaler,* v. 137, no. 9, 1953, p. 455-611; disc., p. 612-616.
Theory of plastic deformation under pressure. Operations, equipment and tools. Tables, graphs, diagrams, photographs. 105 ref. (F22, Q24, CN, Si, Mn, Cr, Ni, Mo, W, V)

46-F. (Swedish.) **Steel Conditioning With the Oxy-Acetylene Method.** Gösta Kihlgren. *Jernkontorets Annaler,* v. 137, no. 9, 1953, p. 617-700; disc., p. 700-701.
Hand scarfing of billets with oxy-acetylene flame and powder scarfing method for high alloy steels. Tables, graphs, diagrams. (F21, AY)

47-F. **Electrical Drive of 14-In. Reversing Cold Strip Mill.** *Engineer,* v. 196, Dec. 4, 1953, p. 728-730.
Electrical equipment for laboratory rolling mill used for study of variables such as speed, tension and gage control. Photograph, circuit diagram. (F23)

48-F. **A Modern Automatic Fuel Shut-Off System for Soaking Pits.** A. L. Lancaster. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 69-76; disc., p. 76.
Position of furnace covers or doors controls firing conditions in furnace pits. Photograph, diagrams. (F21)

49-F. **Speed Regulation for Tandem Tube Mill Drives.** F. H. Wickline. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 84-86.
Successful applications of electronic controls in the steel industry. Photograph, diagrams, graphs. (F26)

50-F. **The Story of Wire.** Rodman R. Tatnall. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 129-134.
Equipment and techniques employed in wire processing. Outline of its applications. Diagram, photographs. (F28)

51-F. **The Rolling of Metals and Alloys. I. Historical Development of the Rolling Mill.** Eustace C. Larke. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1081-1091.
Includes graphs, diagrams, photographs. 33 ref. (To be continued.) (F23)

52-F. **Coating Paves Way for Drawing Speedup.** *Steel,* v. 133, Dec. 21, 1953, p. 82-83.
By replacing conventional lime coating practice with a dry, thin-film lubricant, one plant tripled production with 3-die draw benches. Photograph, tables. (F28, F1)

53-F. (Russian.) **Investigation of the Nature of Deformation During Free Upsetting and Upsetting in Forms.** L. N. Moguchii. *Izvestiia Akademii Nauk SSSR, Otdelenie, Tekhnicheskikh Nauk,* 1953, no. 10, Oct., p. 1475-1479 + 1 plate.
Forms were found to increase the nonuniformity of deformation and to decrease plasticity of the forging. Deformability was increased if negative hydrostatic stress was developed in the blank. Table, graph, photographs. 3 ref. (F22, Al)

54-F. **How Kaiser Aluminum Extrudes Aluminum Shapes.** *Industrial Gas,* v. 32, Dec. 1953, p. 4-5.
Equipment, plant layout and operating procedures. Photographs. (F24, Al)

55-F. **Britain's Biggest Aluminum Fabricator. II.** *Modern Metals,* v. 9, Dec. 1953, p. 35-36, 38, 40, 42, 44.
Facilities and operations of Northern Aluminum Co., England, including bar mills, wire drawing equipment, rolling mills and scrap reclaiming plant. British applications of aluminum in aircraft, automobiles, containers and ships. Photographs. (F general, T24, T21, T22, T10, Al)

56-F. Tolerances in Drop Forging. Otto Kienzle. *Steel Processing,* v. 39, Dec. 1953, p. 654-658, 667.

Factors to be considered in determining tolerances. Diagrams, graphs. (F22)

57-F. "Hot Squeeze". Extrusion of Alloy Steel Shapes Perfected by Harvey, Cuts Machining Costs. *Western Metals,* v. 11, Dec. 1953, p. 44-46.

Development and advantages of process. Photographs. (F24, AY)

58-F. Electric Motors and Control for Slip Type Wire Drawing Machines. H. A. Dickerson. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1295-1304, 1334-1337, 1339, 1341, 1343.

Motors and controls used in drawing copper wire for electrical conductors. Graphs, diagrams, photographs. (F28, Cu)

59-F. How Cold Reduction Affects Several Properties of 18-8 Stainless Steel Wire. Samuel Storchheim. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1310-1311, 1314.

Results of experimental studies. Tables, graphs. 2 ref. (F28, Q general, SS)

60-F. Soaking Pit Practice at the Normanby Park Steelworks of John Lysaght Ltd. A. H. Norris. *Iron and Steel Institute, Journal,* v. 175, Dec. 1953, p. 353-359.

Results of three years' experience of working a battery of one of the first postwar installations of one-way top-fired soaking pits. Results show how modern advances in instrumentation and construction have a considerable effect on heating efficiency, in regard to both heat consumption and quality of steel. Photographs, graphs, tables. (F21)

61-F. 'Very Thin' Magnesium Strips Produced by Modified Hot Rolling. L.V. Martikonis. *Light Metal Age,* v. 11, Dec. 1953, p. 14-15.

Electric current applied so that magnesium strip is the resistance element and the controlled flow of current developed desired temperature. Photographs. (F23, Mg)

62-F. Upset Forging. *Metal Trends,* v. 1, no. 4, 1953, p. 6-9.

Today's modern upset machines save weight, freight and money. Diagram, photographs. (F22)

63-F. Drop Forging. Ralph H. Eshelman. *Tool Engineer,* v. 32, Jan. 1954, p. 73-82.

Process and equipment supplementary operations, materials, costs, die design and recent developments. Photographs, diagrams, graphs, tables. (F22)

64-F. The Role of the Laboratory in Steel Wire Manufacture. W. A. Sandilands. *Wire Industry,* v. 20, Dec. 1953, p. 1177-1179, 1181-1182.

Control of raw materials and processes, research and development, reviews and statistical control, assistance to sales department and standards and specifications. 6 ref. (F28, S12, CN)

65-F. Straightening of Rolling Mill Products. E. Siebel. Henry Brutcher, Altadena, Cal., Translation no. 2815, 10 p. + 1 plate. (From *Stahl und Eisen,* v. 72, no. 21, 1952, p. 1298-1301.)

Previously abstracted from original. See item 323-F, 1952. (F29)

66-F. Steels for Large Forgings. S. Ammareller and P. Grün. Henry Brutcher, Altadena, Cal., Translation no. 3012, 23 p. + 2 plates. (Condensed from *Stahl und Eisen,* v. 72, no. 12, 1952, p. 653-662; disc., p. 662.)

Previously abstracted from original. See item 217-F, 1952. (F22, D9, Q23, ST)

67-F. Friction, Wear, and Lubrication in Wire Drawing. W. Papsdorf. Henry Brutcher, Altadena, Cal., Translation no. 3050, 20 p. + 1 plate. (From *Stahl und Eisen,* v. 72, no. 8, 1952, p. 393-399.)

Previously abstracted from original. See item 139-F, 1952. (F28, Q9)

68-F. Effect of Processing Conditions on the Properties of Heavy Forgings for Steam Turbines. R. Schinn. Henry Brutcher, Altadena, Cal., Translation no. 3077, 18 p. + 2 plates. (Condensed from *Stahl und Eisen,* v. 72, no. 12, 1952, p. 676-683.)

Previously abstracted from original. See item 218-F, 1952. (F22, D9, J26, Q general, S13, ST)

69-F. Causes of Fine Surface Defects in the Hot Working of Plain Carbon Steel. H. Buchholtz and R. Pusch. Henry Brutcher, Altadena, Cal., Translation no. 3100, 23 p. + 2 plates. (From *Stahl und Eisen,* v. 73, no. 4, Feb. 12, 1953, p. 204-212.)

Previously abstracted from original. See item 137-F, 1953. (F21, CN)

70-F. Investigation of Pressures and Work Required in the Cold Extrusion of a Number of Steels. H. D. Feldmann. Henry Brutcher, Altadena, Cal., Translation no. 3138, 16 p. + 4 plates. (From *Stahl und Eisen,* v. 73, no. 3, 1953, p. 165-174.)

Previously abstracted from original. See item 115-F, 1953. (F22, ST)

71-F. Metal Soaps (Stearates) for the Drawing of Steel Wire. K. Schimz. Henry Brutcher, Altadena, Cal., Translation no. 3165, 4 p. (From *Draht,* [*German Ed.*], v. 4, no. 8, 1953, p. 297.)

Nature of metal soaps studied, data on their melting point, bulk

density and ignition residue. Best soaps for ordinary low-carbon steels and for high-grade and alloy steels. Table. (F28, AY)

72-F. (German.) **Ingot Holders of Metal-Extrusion Presses.** H. M. Hiller. *Metall*, v. 7, nos. 23-24, Dec. 1953, p. 993-1000.

Method of determining important data on designing ingot holders. Inserts can be varied and adapted to plant requirements by varying degree of shrink fitting. Tables, diagrams, graphs. 5 ref. (F24, Cr, W, AY)

73-F. (German.) **Designing and Producing Large Forgings.** H. Gummert. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 95, no. 34, Dec. 1, 1953, p. 1141-1145.

Forging machines, materials, heat treating and shaping of different types of large forgings. Practical suggestions on procedure and testing. Tables, graphs, diagrams, photographs. 3 ref. (F22, J general, AY)

74-F. Speed, Control and Uniformity in Soaking Pit Heating. P. F. Kinyoun. *American Iron and Steel Institute, Preprint*, Oct. 1, 1953, 11 p.

Paper presented at Youngstown Regional Technical Meeting of AISI, Oct. 1, 1953. Design of the pits; shape, size, composition and physical condition of the charge; type of fuel used; and final use of the product. Tables, drawing, photograph. (F21)

75-F. Many New Rolling Mill Installations Completed in 1953. A. F. Kenyon. *Blast Furnace and Steel Plant*, v. 42, Jan. 1954, p. 83-89.

Includes photographs, diagram, table, oscillograph. (F23, ST)

76-F. Thyratron Control of Air Pistons. Robert L. Alcorn, Jr. *Electrical Manufacturing*, v. 53, Jan. 1954, p. 82-87.

Electronic control of Chambersburg impacter used in drop forging. Diagrams, photograph. (F22)

77-F. Biggest Production Tool. *Fortune*, v. 49, Feb. 1954, p. 123-128.

Air Force's 50,000-ton die-forging press now being installed in Worcester, Mass. Photographs. (F22)

78-F. Mechanized Sheet and Tinplate Mills. John H. Mort. *Iron & Steel*, v. 27, Jan. 1954, p. 3-7.

Equipment, plant layout, and electrical energy consumption. Photographs, table. (To be continued.) (F23, CN)

79-F. Roll Pass Design for Beams. D. A. Winton. *Iron and Steel Institute, Journal*, v. 176, Jan. 1954, p. 3-17.

Basic principles and influence of mill design on roll design, roll clearance, and position of the passes. Curves are suggested for calculating numbers and sizes of passes for rolling any size of beam. Diagrams, tables, graphs. (F23)

80-F. Induction Heating in Modern Forging Plants. A. R. Baffrey. *Metal Treatment and Drop Forging*, v. 21, Jan. 1954, p. 35-39.

Some Belgian induction-heating units for this purpose. Graphs, photographs, diagram. (F21, F22)

81-F. Press Forgings—Their Use and Growth. Ernest C. Morse. *Modern Industrial Press*, v. 16, Jan. 1954, p. 42, 44, 46, 48, 50, 52, 54.

Includes photographs, graph. (F22)

82-F. The Rolling of Metals and Alloys. I. Historical Development of the Rolling Mill. Eustace C. Larke. *Sheet Metal Industries*, v. 31, no. 321, Jan. 1954, p. 61-72.

Drive systems and machines. Photographs, diagrams. 24 ref. (To be continued.) (F23)

83-F. Modern Trends in the Manufacture and Use of Cold Upsetting Tools. II. J. Billigmann. *Draht (English Ed.)*, 1953, no. 17, Dec., p. 13-18.

Factors influencing tool life and means of improving it, including design modifications, choice of steels and heat treating processes. Diagrams, tables, graphs. 12 ref. (F22, T5, TS)

84-F. A Complete Plant for the Manufacture of Soldering Wires. Karl Drechsler. *Draht (English Ed.)*, 1953, no. 17, Dec., p. 27-29.

Equipment and operating procedures including soldering wire press, coarse multiple drawing machine for soldering wire, multiple soldering wiredrawing machine, and hand polishing machine. Photographs. (F28, SG-f)

85-F. Drawing Power, Rolling Pressure and Rolling Work Measurements by Means of Stress Measuring Strips. K. Fink and W. Lueg. *Draht (English Ed.)*, 1953, no. 17, Dec., p. 42-43.

Apparatus and techniques of testing method. Diagrams. (F28)

86-F. Metal Soaps (Stearates) for Wire Drawing. Karl Schimz. *Draht (English Ed.)*, 1953, no. 17, Dec., p. 44-45.

Composition, properties, applications, and advantages. (F1, F28)

87-F. (German.) **Development and Status of Dynamo and Transformer Sheet Production.** Hans-Heinz Meyer and Hermann Schlüter. *Stahl und Eisen*, v. 73, no. 26, Dec. 17, 1953, p. 1706-1715; disc., p. 1715-1717.

Production, properties and chemical composition of hot rolled sheet steels and effects of melting methods, rolling conditions, and annealing. Production and properties of cold-rolled strip. Graphs, tables. 89 ref. (F23, D general, J23, ST)

88-F. (Portuguese.) **Giant Rolling Mills Controlled by Electronic Robots Will Produce Plates at 100 Km. Per Hour.** Pierre Devaûx. *Engenharia, mineracao e metalurgia,* v. 18, no. 108, Sept.-Oct. 1953, p. 293-294.

The process and its effects on economic equilibrium of Western Europe. Photographs. (F23)

89-F. (Russian.) **Increasing Efficiency of Forge Hammers.** S. S. Lifshits. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 57-58.

Possibility of increasing efficiency from 1.5 to 2 times and of decreasing steam expenditure by 30-50%. Tables, diagrams. (F22)

90-F. (Russian.) **Pipe-Welding Tool for Production of Electric Welded Pipe.** M. E. Katsnel'son. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 78-81.

Manufacture of pipes from hot or cold rolled steel strip. Operation of the welder. Diagram, table, graph. (F26, ST)

91-F. **Forging Procedures for Stainless Steels. II.** Lester F. Spencer. *Industrial Heating,* v. 21, Jan. 1954, p. 44-46, 204, 206, 208.

Necessary equipment for the forging process. Photographs. 5 ref. (F22, SS)

92-F. **Heat Transfer in a Continuous Reheating Furnace.** R. J. Sarjant and D. Smith. *Institute of Fuel, Journal,* v. 27, Jan. 1954, p. 16-24.

Systematic experimental investigation into thermal factors of furnace design. Tables, graphs. 17 ref. (F21)

93-F. **Application and Use of Self-Centering Rolls.** E. T. Lorig. *Iron and Steel Engineer,* v. 31, Jan. 1954, p. 59-72; disc., p. 73.

Many ingenious refinements have been developed in application of self-centering rolls to handling strip. Diagrams. (F23)

94-F. **Giant Machine Cold Reduces 18-Inch Tubing.** *Machine Design,* v. 26, Jan. 1954, p. 126-129.

Design, construction, and operating characteristics of 100-ft. tube reducer. Diagrams, photographs. (F26)

95-F. **Welded Steel Tubing in Heavy Equipment.** Rex Cleveland. *Product Engineering,* v. 25, Jan. 1954, p. 186-191.

Design, applications, and manufacturing techniquues of equipment made from many shapes of tubing. Diagrams, photograph, table. (F26, G general, T general, CN)

96-F. **Rolling Thin Strip in France. American Manufacturer Supplies Mill.** *Steel Equipment & Maintenance News,* v. 7, Jan. 1954, p. 16-17.

International engineering is credited with a French steel company's success in producing extremely thin strip for French industry. Photographs. (F23, ST)

97-F. **Self Contained Pump Units as Applied to Extrusion Presses.** A. J. de Matteo. *Steel Processing,* v. 40, Jan. 1954, p. 15-20.

Equipment, plant layout and operating procedures. Photographs, diagrams. (F24)

98-F. **Manufacture and Properties of Large Forgings.** Adolph O. Schaefer. *Steel Processing,* v. 40, Jan. 1954, p. 24-32.

Equipment, plant layout and operating procedures. Photographs, tables, diagrams. (F22, AY)

99-F. **Integrated Aluminum Window Fabricator Has Complete Extrusion Facilities.** *Western Metals,* v. 12, Jan. 1954, p. 52-53.

Equipment and techniques employed. Photographs. (F24, Al)

100-F. **New Methods and Instruments for the Inspection of Drawing Dies.** W. Lueg. *Wire Industry,* v. 21, Jan. 1954, p. 63, 65, 67. (Translated from *Stahl und Eisen,* v. 71, 1951, p. 157-170.)

Previously abstracted from original. See item 111-F, 1951. (F28)

101-F. (Russian.) **Direct Electric Heating as a Means of Intensifying the Wiredrawing Process.** S. I. Gubkin and V. S. Muras. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 803-806.

Operations and advantages of the method. Micrograph, graphs. 3 ref. (F28)

102-F. **Lockheed Mechanizes Extrusion Bending.** Fred C. Hoffman. *Machinery,* v. 60, Feb. 1954, p. 196-199.

Equipment and techniques employed. Photographs. (F24)

103-F. **High-Speed Mill Forms, Induction Welds and Sizes Thin-Gage Nonferrous Tubing.** Thomas J. Crawford. *Metal Progress,* v. 65, Feb. 1954, p. 65-69.

Machine for continuous high-speed cold forming and welding. Photographs, micrograph, diagram. (F26)

104-F. (English.) **The Sheffield Experimental Cold Rolling Mill.** H. Ford. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 19, no. 11, Nov. 1953, p. 323-329.

Investigation, equipment and instruments for measuring roll force and torque, strip tension and thickness. Diagrams, photographs. 36 ref. (F23)

105-F. (German.) **Cold Reciprocating Rolling of Pipes. Experimental Results of Investigation of the Rolling Process.** Friedrich W. Neumann and Erich Siebel. *Stahl und Eisen,* v. 74, no. 3, Jan. 28, 1954, p. 133-145.

Process, effect of various factors and calculation of rolling pressure. Graphs, photographs, diagrams, tables. 6 ref. (F23, ST, AY, Al, Cu)

106-F. (German.) **New Regulated Drive of a Rod Mill.** Karl Meister. *Stahl und Eisen,* v. 74, no. 3, Jan. 28, 1954, p. 151-154.

Shows that an a.c. shunt collector motor may be used for increasing efficiency. Photograph, diagrams, tables, graphs. (F27, ST)

107-F. Manufacture and Properties of Large Forgings. Adolph O. Schaefer. *American Iron and Steel Institute, Preprint,* Dec. 3, 1953, 27 p.

Open-die forgings made either under hammers or on presses. Photographs, tables, diagrams. (F22, Q general, ST)

108-F. Mechanized Sheet and Tinplate Mills. John H. Mort. *Iron & Steel,* v. 27, Feb. 1954, p. 55-60.

Electrical energy consumption. Tables, graphs. (To be continued.) (F23, ST)

109-F. Knurling of Cogging Rolls. A. H. Norris. *Iron and Steel Institute, Journal,* v. 176, Feb. 1954, p. 157-158.

It is believed that knurling will increase roll life and reduce fire-cracking, with small loss of output due to slipping. Photographs. (F23)

110-F. On Heavy Forging and Extrusion Presses. A. Zeitlin. *Light Metals,* v. 17, Feb. 1954, p. 62-63.

Equipment and capabilities of presses having ratings of 25,000 to 75,000 tons. Diagrams, photographs. (To be concluded.) (F22, F24)

111-F. Hot Steel Extrusions. Theodore B. Merrill, Jr. *Materials & Methods,* v. 39, Feb. 1954, p. 96-97.

Processes for shapes too complex or from alloys too brittle to roll, and small lots of special shapes. Photographs, diagram. (F24, ST)

112-F. Progress in Steelmaking. Titanium Carbide New Elixir of Life for Rod Mill Guides. S. Allen Oviatt and Patrick H. Gribbin. *Steel,* v. 134, Feb. 15, 1954, p. 128-130.

Unusual properties of new guide insert material, Kentanium, make it especially adaptable for handling red-hot rod through today's high-speed mills. Photographs, diagram. (F27, ST)

113-F. Extruding Aluminum Wheels, Fans Improves Quality, Strength and Increases Output. *Western Metals,* v. 12, Feb. 1954, p. 70-71.

Press and procedure used in hot extrusion of aluminum-alloy aircraft parts. Photographs. (F24, Al)

114-F. Steel Sheet Rolling and Annealing Practice. N. G. Fraser. *Australasian Engineer,* 1954, Jan., p. 65-74.

Various types of mills used in steel sheet rolling. Reasons for annealing sheets and manner in which operation is carried out. Graphs, drawings, photographs. 4 ref. (F23, J23)

115-F. Extrusion of Alloy Steels. New 1,150-Ton Loewy Press at Low Moor Fine Steels, Ltd. *British Steelworker,* v. 20, Feb. 1954, p. 60-62.

Hydraulic press, dies and process using glass as a lubricant. Diagram. (F24, AY, SS)

116-F. Forging Brass. V. *Copper & Brass Bulletin,* 1954, Feb., no. 167, p. 8-9.

Standard alloy for hot forged or die pressed parts is forging brass which possesses ideal combination of properties. Table, photographs. (F22, Cu)

117-F. Impact of Technical Developments in Light Flat Rolling on the Consuming Industries. William T. Hogan. *Iron and Steel Engineer,* v. 31, Feb. 1954, p. 67-71; disc., p. 71-72.

Recent developments in rolled products. Includes electrolytic tin plating, continuous galvanizing and annealing and magnetic properties of iron-silicon alloys. Tables. (F23, L17, L16, J23, P16, AY, Sn, Zn)

118-F. Heat Processing in Industry —Facts and Figures. Frederic O. Hess. *Iron and Steel Engineer,* v. 31, Feb. 1954, p. 73-84; disc., p. 84.

Furnace design, heat transfer, temperature control and effects of various heating cycles on microstructure of steel blooms. Diagrams, graphs, micrographs, photographs. (F21, M27, ST)

119-F. Electrical Systems for Hot Strip Mills. R. E. Marrs. *Iron and Steel Engineer,* v. 31, Feb. 1954, p. 99-106; disc., p. 106-108.

Width and thickness gages, speed and voltage regulators, individual generators, magnetic amplifiers and synchronous motors. Circuit diagrams, table, photographs, graphs. (F23, S14)

120-F. Drop Forgings From the Customer's Viewpoint. R. J. Brown.

Metal Treatment and Drop Forging, v. 21, Feb. 1954, p. 51-55; disc., p. 55-56.

Much can be done to increase probability of poor quality steel being detected before forging operations. Closer control can be given to sensitive heat treatment operations essential to attain the best properties from lean alloy steels. Photographs. (F22, AY)

121-F. Oils for Metal Rolling. A. L. H. Perry. *Scientific Lubrication,* v. 6, Feb. 1954, p. 14-20.

Equipment and classes of oils. Photographs, diagram. 2 ref. (F1)

122-F. A Comparison of American and German Drop Forging Development. Paul Hansen. *Steel Processing,* v. 40, Feb. 1954, p. 77-83.

Reason for difference in productivity may be the fact that in American forging plants, manufacturing process can be designed for an exceptionally high volume of identical parts. Photographs, tables, diagram. (F22)

123-F. Internal Stresses in Some Types of Forging. I. Charles Sykes. *Steel Processing,* v. 40, Feb. 1954, p. 101-107, 118, 120.

Diagrams, graphs, tables. 9 ref. (To be continued.) (F22, Q25)

124-F. A Layman's Comparison of Methods for Rapid Heating of Larger Steel Sections. H. E. Trout, Jr. *Steel Processing,* v. 40, Feb. 1954, p. 111-114.

Rapid heating with gas and heating by induction. Photographs, graph. (F21)

125-F. Press Forging. Ralph H. Eshelman. *Tool Engineer,* v. 32, Mar. 1954, p. 77-86.

Review of mechanical and hydraulic dies, presses and procedures. Discussion of automation. Graphs, photographs, tables, diagrams, nomogram. (F22, Cu)

126-F. Integrated Shop Produces Close Tolerance Upset Forgings With Weight, Cost Savings. V. J. Taylor and L. R. Huizenga. *Western Metals,* v. 12, Feb. 1954, p. 47-49.

Superior qualities of forgings, forging presses and dies and examples of artillery shells and other items produced by forging. Photographs. (F22, CN)

127-F. Fundamental Aspects of the Cold Working of Metals. Maurice Cook and T. L. Richards. Paper from "The Cold Working of Non-Ferrous Metals and Alloys". Institute of Metals, Monograph and Report Series no. 12, p. 7-26; disc., p. 165-206 + 2 plates.

Provides background study, in light of existing knowledge and concepts, of mechanism of changes which take place when metals and alloys are plastically deformed in the cold state. Micrographs. 37 ref. (F general, G general)

128-F. Lubricants for the Cold Working of Non-Ferrous Metals. S. F. Chisholm. Paper from "The Cold Working of Non-Ferrous Metals and Alloys". Institute of Metals, Monograph and Report Series no. 12, p. 27-44; disc., p. 165-206.

Processes of cold rolling and press, tube and wire drawing in light of demands they make on lubricants. Suitable lubricants suggested in each case based on practical experience. Table. (F1, Cu, Al)

129-F. The Cold Rolling of Non-Ferrous Metals in Sheet and Strip Form. C. E. Davies. Paper from "The Cold Working of Non-Ferrous Metals and Alloys". Institute of Metals, Monograph and Report Series no. 12, p. 45-80; disc., p. 165-206 + 4 plates.

Modern technique in production of cold rolled sheet and strip in the two classes of material which form the bulk of the output of the non-ferrous metal mills. Copper and copper alloys and aluminum and its light alloys. Diagrams, photographs. 3 ref. (F23, Cu, Al)

130-F. Wire-Drawing Technique and Equipment. F. T. Cleaver and H. J. Miller. Paper from "The Cold Working of Non-Ferrous Metals and Alloys". Institute of Metals, Monograph and Report Series no. 12, p. 81-106; disc., p. 165-206 + 4 plates.

Principal landmarks in development of wire drawing industry in England from earliest beginnings until present times. Description of present day machines; detailed account of current practice in production of copper, brass, bronzes and other copper alloy wire, and of aluminum and alloy wires. Various types of defects which are encountered. Diagrams, tables, flowsheets, photographs. (F28, Cu, Al)

131-F. (Russian.) **Modern Methods of Processing Metals.** A. E. Prokopovich. *Fizika v Shkole,* v. 14, no. 1, Jan.-Feb. 1954, p. 8-26.

Various metalworking processes. Diagrams, photographs. (F general, G general)

132-F. Extruded Engine-Rings. P. V. Brown. *Aircraft Production,* v. 16, Mar. 1954, p. 106-110.

Extrusion of heavy-section circular parts for gas turbines. Photographs, diagrams, micrograph. (F24, SG-h, SS)

133-F. Thin Gauge Steel Rolled on Y-Mill in France. *Blast Furnace and Steel Plant,* v. 42, Mar. 1954, p. 336-338.

Equipment, plant layout and operating procedures. Photographs. (F23, ST)

134-F. Mechanized Sheet and Tinplate Mills. John H. Mort. *Iron & Steel,* v. 27, Mar. 1954, p. 83-87.

Study of electrical energy consumption makes clear that motor rating and flywheel design should be determined on basis that entries of packs on twin stands synchronize at all times and peak loads are thus accentuated. Tables, diagram, graphs. (To be concluded.) (F23, ST, Sn)

135-F. Atomic Energy Production Requires Nickel-Plated Pipe. Edgar Altholz. *Machinery,* v. 60, Mar. 1954, p. 166-172.

Making and plating of pipe at western New York plant. Photographs. (F26, L17, Ni)

136-F. Forging Twists and Tricks. H. Winkleman. *SAE Journal,* v. 62, Mar. 1954, p. 27-28.

Based on secretary's report of Panel on Forging, SAE Tractor Production Forum, Milwaukee, Sept. 1953. Gears for automobile and tractor differentials are being completed on forging hammers. U. S. forgers become more enamored of counterblow hammers. Photograph. (F22)

137-F. The Rolling of Metals and Alloys. I. Eustace C. Larke. *Sheet Metal Industries,* v. 31, no. 323, Mar. 1954, p. 241-248.

Historical development of rolling mill. Graphs, photographs, table, diagram. 11 ref. (To be continued.) (F23)

138-F. Coatings in Cold Forming. Dual Role Makes Lubricant Doubly Important. Samuel Spring. *Steel,* v. 134, Mar. 8, 1954, p. 116-119.

Lubricants have a tough act in severe cold forming. Phosphate combinations are achieving important success in twin function of surface separator and friction reducing agent. Tables, photographs, micrographs. 4 ref. (F1, G21)

139-F. (English.) **The Graphical Representation of the Drawing Process in the Drawing of Wire on Multiple Wire Drawing Machines, With Special Reference to Slip, Accumulation and Die Wear.** F. Liekmeier. *Draht (English Ed.),* 1954, no. 19, Feb., p. 15-18.

Plotting of drawing processes as graphs with logarithmic coordinates shows effects of slip, accumulation and die wear in the various basic types of machines. Graphs. 3 ref. (F28)

140-F. (French.) **Special Aluminum Alloys Obtained by Extrusion and Their Application. II.** Pierre Pétrequin and Michel Costeraste. *Revue de l'Aluminium,* v. 31, no. 206, Jan. 1954, p. 33-41.

Various types of light alloys can withstand special fabrication methods. Limits of length, thickness and profile of the products. Tables, diagrams, graphs. (To be continued.) (F24, T general, Al)

141-F. (German.) **Calculation of Efforts and Power Demand in the Ehrhardt Process of Making Seamless Pipe.** A. Geleji. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 3-4, 1953, p. 477-505.

Theoretical and practical principles for design of equipment for Ehrhardt system of making seamless tubing (piercing press and extrusion bench). Diagrams. 7 ref. (F26)

142-F. (German.) **The Hot-Working of Metals.** Erich Siebel. *Zeitschrift für Metallkunde,* v. 45, no. 1, Jan. 1954, p. 1-7.

Resistance of various metals as a function of temperature and rate of deformation; special importance ascribed to temperature increase due to working of light metals; and different types of stress conditions in various working processes. Graphs, tables, photographs. 5 ref. (F general, Al, Cu, Fe, Mg, ST)

143-F. (German.) **Processes in the Hot-Working of Zinc and Zinc Alloys.** Karl Löhberg. *Zeitschrift für Metallkunde,* v. 45, no. 1, Jan. 1954, p. 8-13.

Grain-size reduction as result of hot-rolling or pressing is shown to be ascribed to recrystallization. There is no clear-cut difference between cold and hot working, provided temperature is above room temperature and effect of rate of deformation on plasticity of zinc is taken into account. Graphs, photographs, diagrams. 21 ref. (F23, G1, N5, Zn)

144-F. (Russian.) **Calculation of Forces During Cold Rolling of Shapes With Two Rollers.** V. D. Lisitsin. *Vestnik Mashinostroeniia,* v. 33, no. 11, Nov. 1953, p. 74-77.

Mathematical method of calculating and measuring forces. Diagrams. 6 ref. (F23)

145-F. Forging and Hot Forming. I. George P. Holman. *Industrial Heating,* v. 21, Mar. 1954, p. 474 + 5 pages.

Modern forming methods and

equipment. Table. (To be continued.) (F22, G general)

146-F. New Slabbing Mill Speeds Steel Production Cycle. W. G. Patton. *Iron Age,* v. 173, Mar. 4, 1954, p. 151-155.

Efficient processing of bigger ingots, automatic scarfing, speeding up of steel production cycle and increased availability of weldless steel coils are possible. Photographs. (F23, ST)

147-F. Fuel Selection for Soaking Pits. F. R. Pullen. *Iron and Steel Engineer,* v. 31, Mar. 1954, p. 80-82; disc., p. 82.

High air preheat stepped up performance of soaking pit. (F21)

148-F. Use of Oxyacetylene in Rolling Mills. R. L. Deily. *Iron and Steel Engineer,* v. 31, Mar. 1954, p. 83-90; disc., p. 90.

Uses for oxy-acetylene are found to be economical in steel plant operations. Drawings, photographs, graph, table. 6 ref. (F23, ST)

149-F. Direct Rolling of Carbon Steel Ingots to Plates on Three-High and Four-High Plate Mills. Robert C. McMichael. *Iron and Steel Engineer,* v. 31, Mar. 1954, p. 91-99; disc., p. 99-102.

Operations show that the four-high plate mill has many advantages over three-high unit. Tables, diagram, photographs. 12 ref. (F23, CN)

150-F. Titanium Carbide Rod Mill Guides Give Improved Rod Production. *Iron and Steel Engineer,* v. 31, Mar. 1954, p. 121-122.

Equipment and performance characteristics. Photographs. (F27, C-n)

151-F. 16 Percent Aluminum-Iron Alloy Cold Rolled in the Order-Disorder Temperature Range. Joseph F. Nachman and William J. Buehler. *Journal of Applied Physics,* v. 25, Mar. 1954, p. 307-313.

Methods of fabricating from cast slab to thin-gage sheet. Melting, casting, homogenizing, hot rolling and cold rolling at 575° C. and room temperature. Magnetic properties and oxidation resistance. Micrographs, photographs, oscillograms, diagrams, tables, graphs. 9 ref. (F23, P16, R2, Fe, Al)

152-F. How About Fabricating Zinc Coated Steels? Lester F. Spencer. *Tooling and Production,* v. 19, Mar. 1954, p. 41 + 8 pages.

Use and advantages of Sendzimer process for surface protection. Table, photographs. 8 ref. (F23, ST, Zn)

153-F. Titanium Forging Requirements. L. R. Frazier. *Tooling and Production,* v. 19, Mar. 1954, p. 59.

Forging in general and effects on ductility. (F22, Q23, Ti)

154-F. Problems of the Control of Dimension, Shape, and Finish in the Rolling of Sheet and Strip and in the Drawing of Wire. Hugh Ford and J. G. Wistreich. *Institute of Metals, Journal,* v. 82, Mar. 1954, p. 281-290 + 1 plate.

Main sources of variations. Reference to problem of hot rolling as it affects strip and rod. Diagrams, tables, graph. 21 ref. (F23, F28)

155-F. The Control of Quality in the Hot and Cold Rolling of Aluminum and Aluminum Alloys. F. King and A. N. Turner. *Institute of Metals, Journal,* v. 82, Mar. 1954, p. 291-306 + 1 plate.

Theoretical and practical implications of control. Effect of each fabricating process on properties and inspection methods. Graphs, table, micrographs, photograph. 10 ref. (F23, S general, Al)

156-F. The Control of Properties and Structure in the Hot and Cold Rolling of Copper and Copper-Base Alloys. W. W. Kee. *Institute of Metals, Journal,* v. 82, Mar. 1954, p. 307-322 + 1 plate.

Various phenomena arising during processes of rolling and methods of controlling grain size, directionality, shape, gage and surface quality are considered in relation to parts of process by which they are most affected. Charts, graphs, micrographs, photograph. 24 ref. (F23, M27, Cu)

157-F. Some Factors Affecting the Quality of Extrusions. Christopher Smith and Norman Swindells. *Institute of Metals, Journal,* v. 82, Mar. 1954, p. 323-333.

Practice of extrusion in light of effects on quality of copper and aluminum alloy products. Table. 7 ref. (F24, Cu, Al)

158-F. Continuous Crankshaft Press Forging. *Mechanical World and Engineering Record,* v. 134, Mar. 1954, p. 110-111.

Use of rotating furnace with electrically timed hydraulic and mechanical handling appliances. Diagram, photographs. (F22)

159-F. It Doesn't Take a Big Shop to Do a Big Job. D. F. Hammer. *Steel Processing,* v. 40, Mar. 1954, p. 149-155, 195.

Efficient operation of forging plant produces high-quality products. Photographs, diagrams. (F22)

160-F. Internal Stresses in Some Types of Forging. II. Charles Sykes. *Steel Processing,* v. 40, Mar. 1954, p. 168-173, 186.

Transformation characteristics of steel. Cooling rate chosen to meet desired internal stress requirements. Tables, graphs. 3 ref. (F22, Q25, ST)

161-F. West's Largest Steel Tube Drawbench at Pacific Tube Has 150,000 Lb. Pull. *Western Metals,* v. 12, Mar. 1954, p. 48-49.

New bench will draw steel tubing to a maximum length of 52 ft. with an outer diameter as great as 6½-in. Photographs, diagram. (F26, ST)

162-F. (Russian.) **Effect of Form of Working Surface of a Mandrel on the Process of Tube Expansion.** Iu. G. Proskuriakov. *Vestnik Mashinostroeniia,* v. 34, no. 2, Feb. 1954, p. 43-49.

Improves quality of surface. Various parameters and their effects. Diagrams, tables, graphs, photographs. 7 ref. (F26)

163-F. (Book.) **Metal Quality.** 4th Ed. 64 p. 1954. Drop Forging Association, 605 Hanna Bldg., Cleveland 15, Ohio. $1.00.

Latest closed-die forging techniques and new steelmaking practices. (F22)

164-F. (Book.) **Rolling Mills, Rolls and Roll Making.** 108 p. 1953. Mackintosh-Hemphill Co., 901 Bingham St., Pittsburgh 3, Pa. $5.00.

Beginnings of modern rolling, rolling in the U. S., and the story of rolls. Formation of Mackintosh-Hemphill Co., and description of manufacture of cast iron and steel rolls as practiced by the firm. (F23, T5, ST, CI)

165-F. Vickers-Armstrongs Viscount. II. Basic Processes: Frame Rolling; Taper and Circular Rolling; Rotary Forming; Stinger Piercing. *Aircraft Production,* v. 16, Apr. 1954, p. 139-146.

Methods of shaping and manipulation. Photographs, diagram. (F23, G11)

166-F. Beryllium. P. L. Lowenstein, A. R. Kaufman and S. V. Arnold. *American Machinist,* v. 98, Apr. 12, 1954, p. 203-206.

Extrusion, rolling and forging methods. Diagrams, photograph. (F24, F23, F22, Be)

167-F. Beryllium. Shields M. Bishop. *American Machinist,* v. 98, Apr. 12, 1954, p. 207-208.

Rolling and forging methods. Photographs. (F23, F22, Be)

168-F. The Theory and Practice of Wire Drawing. I. Some Researches in Wire Drawing. F. C. Thompson. *Australasian Engineer,* 1954, Feb., p. 42-49.

Considers equation for work done during wiredrawing. Drawing speed, die angle and load, reduction in area, yield stress and temperature reviewed. Graphs, photographs, diagrams, tables. 18 ref. (To be continued.) (F28)

169-F. Electrical Drive for a Planetary Rolling Mill. *Engineer,* v. 197, Mar. 26, 1954, p. 458-459.

Possible to vary the ingoing speed of mill and outgoing speed of strip. Motor-generator set and automatic control gear are installed in specially ventilated room, while mill motors, which are installed in rolling bay itself, are force-ventilated to exclude airborne dust. Photographs, diagram, table. (F23)

170-F. Lubricants for Metal-Working Operations in the Non-Ferrous Metals Industry. *Institute of Metals, Journal,* v. 82, Apr. 1954; *Institute of Metals, Bulletin,* v. 2, Apr. 1954, p. 100-104.

Lubricants for hot working, cold rolling and cold drawing. (F1, G21, EG-a)

171-F. Improved Forging Methods Save Steel, Raise Shell Output. W. G. Patton. *Iron Age,* v. 173, Apr. 8, 1954, p. 145-148.

Uses powerful, vertical all-steel presses in place of conventional pierce-and-upset, horizontal draw bench method. Photographs, diagram. (F22, ST)

172-F. Heavy-Duty Tooling for Cold Extrusion of Steel. *Machinery,* v. 60, Apr. 1954, p. 170-175, 237.

Importance of design, material and finish of tools. Photographs, diagrams, tables. (F24, ST)

173-F. The Manufacture of Small-Diameter and Other Special Precision Tubes. *Machinery (London),* v. 84, Mar. 19, 1954, p. 575-585.

Methods employed in precision tube department, with particular reference to hypodermic needle, capillary, Bourdon, high pressure, thin-wall and multibore types. Photographs, micrograph. (F26)

174-F. Manufacture of Bright Drawn Bars and Conduits. Rolt Hammond. *Mechanical Handling,* v. 41, Apr. 1954, p. 180-186.

Mechanical handling in manufacture of bright-drawn bars and steel conduit tubes for electric wiring up to a maximum diameter of 3 in. Photographs, drawings. (F27, ST)

175-F. A Combination Mill for Experimental Rolling of the "New" Metals. A. I. Nussbaum. *Metal Progress,* v. 65, Apr. 1954, p. 121 + 4 pages.

Combination two and four-high

mill developed to furnish research organizations and metallurgical laboratories with low-cost testing apparatus. Table. Photographs. (F23, Ta, Mo, W)

176-F. A High Speed Non-Slip Accumulation Wire-Drawing Machine. N. Davidson. *Wire Industry,* v. 21, Mar. 1954, p. 275, 277, 279.

Quality maintained by increasing existing speeds and more efficiently cooling the wire at each stage. Photographs. (F28)

177-F. (French.) **The "Aptitude to Swaging" of Sheet Metal. II.** Pierre Vauthier. *Métaux, Corrosion-Industries,* v. 29, no. 342, Feb. 1954, p. 57-65.

Relates "P.V.I." test to depth, necking, anisotropy and extension. Diagrams, graphs, tables. (To be continued.) (F25)

178-F. Extruded Rings for Gas Turbines. *Aeroplane,* v. 86, Apr. 2, 1954, p. 401-403.

Fabrication of high-grade stainless steel. Production and design of rings. Photographs, diagrams. (F24, SS)

179-F. The Hot Extrusion of Steel. J. Sejournet. *Engineering,* v. 177, Apr. 9, 1954, p. 463.

Abridged from "The Ugine-Sejournet Process for the Hot Extrusion of Steel", presented at meeting of Iron and Steel Institute and British Section, Société des Ingéniéurs Civils de France, Apr. 1954. Method using glass wool as lubricant for plain-carbon and austenitic stainless steels. (F24, ST, SS)

180-F. The Manufacture of Crankshafts by the Continuous Grain Flow Process. G. Cleghorn and I. H. Burnell. *Institute of Marine Engineers, Transactions,* v. 66, Mar. 1954, p. 49-58; disc., p. 58-64.

Method of operation, particulars of furnaces used for heating bars, straightening, inspection and treatment of the crankshaft forging after it is completed and actual test figures obtained from such crankshafts. Diagrams, photographs, table. (F22, ST)

181-F. Flexible Bar Mill Equipment Permits Fast Service, Close Control. W. G. Patton. *Iron Age,* v. 173, Apr. 15, 1954, p. 132-135.

Fully mechanized, efficiently modern semicontinuous bar mill can retain desirable versatility of hand-operated bar mill. Size range of ½ to 4½ in. is probably unique for steel industry. Tables, photographs. (F23, ST)

182-F. Mechanized Sheet and Tinplate Mills. John H. Mort. *Iron & Steel,* v. 27, Apr. 1954, p. 141-144.

Electrical energy consumption. Tables, graphs. (F23, ST)

183-F. Unusual Electric Drive Features Applied to Fairless Processing Lines. E. E. Vonada. *Iron and Steel Engineer,* v. 31, Apr. 1954, p. 114-119.

Drive systems for pickle line, side trim and recoil and shearing lines. Diagrams. (F general, ST)

184-F. The Modern Electric Weld Pipe and Casing Mill. Norbert C. Rubin. *Iron and Steel Engineer,* v. 31, Apr. 1954, p. 120-123; disc., p. 123-124.

Large electric resistance weld pipe mills utilize higher speeds, yields and efficiencies. New installation discussed. Photographs. (F26)

185-F. Control for a Modern Electric Weld Pipe and Casing Mill. C. E. Smith. *Iron and Steel Engineer,* v. 31, Apr. 1954, p. 124-130; disc., p. 130-131.

Electrical controls furnished for a large resistance welding tube mill, mainly controllers for adjustable voltage d.c. drives and weld power source. Photographs, graph, diagrams. (F26)

186-F. New Swedish Mill Designs and Layouts for Medium and Small Sections and Wire Rod. S. Erik M. Norlindh. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 391-405 + 20 plates.

Development of repeater rolling to a high degree of reliability including breakdown and leader ovals down to 0.2-in. wire rod at final speeds of 4000 ft. per min. Essential new designs allow rolling of small ingots. Diagrams, drawings, photographs. (F23, ST)

187-F. Practical Experience in the Use of Repeaters in a Looping Mill. Hans Wilhelm Riddervold. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 406-411.

Factors affecting working reliability when rolling with repeaters in 3-high and alternating 2-high mills. Sizes of reductions, guides, and repeaters. Photographs, graph, diagrams. (F23)

188-F. The New Fagersta Wire-Rod Mill. K. E. Pihlblad. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 411-414.

Layout and operation of wire-rod mill. Methods used to achieve exact roll setting for Leufvén mill stands. Graph, tables, photograph, diagram. (F27)

**189-F. Roller-Bearings in Swedish Rolling Mills and the S.K.F. Rolling-

Mill Design. Axel Leufvén. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 415-423 + 3 plates.

Importance of oil-injection method. Modern bearing applications in different types of rolling mills. Preloaded bearing housings and design for wire-rod and cold rolling mills. Drawings, photographs, graph. (F23)

190-F. **The Manufacture of Hypodermic Needle Tubing.** *Machinery (London),* v. 84, Apr. 2, 1954, p. 679-686.

Manufacture of small diameter and other special types of precision tubes. Procedure subsequent to "pulling to gage" emphasized. Photographs. (F26)

191-F. **Modern French Aluminium Foil Production.** *Sheet Metal Industries,* v. 31, no. 324, Apr. 1954, p. 313-317.

Methods used at two French plants. Photographs. (F23, Al)

192-F. **The Rolling of Metals and Alloys. I. Historical Development of the Rolling Mill.** Eustace C. Larke. *Sheet Metal Industries,* v. 31, no. 324, Apr. 1954, p. 325-334, 338.

Concludes historical survey of ordinary-type continuous mills for rolling wide strip. Photographs, diagram. 20 ref. (To be continued.) (F23, A2)

193-F. **Metallurgical Requirements of Steels for Cold Extrusion.** D. V. Wilson. *Steel Processing,* v. 40, Apr. 1954, p. 215-223, 255.

Phosphate coatings provide a satisfactory basis for lubrication of ferritic steels in severe cold working operations. Primary limitations of process appear to lie in tool materials and tool design rather than in materials extruded. Graphs, photographs, micrographs, tables, diagrams. 15 ref. (F24, ST)

194-F. **The Economy of Shaped Wire.** Emmett H. Mann. *Wire and Wire Products,* v. 29, Apr. 1954, p. 391-392, 454-456.

Economic advantages and production of shaped wires for use in many fabricating operations. Photographs, table. (F28)

195-F. **A Practical Analysis of the Causes of Die Wear in the Dry-Drawing of Ferrous Wires.** E. P. Riley-Gledhill. *Wire Industry,* v. 21, Apr. 1954, p. 407 + 5 pages.

Improves die life with proper coatings or lubricants and by alignment of ingoing wire. Tables, diagrams, photograph. (F28)

196-F. (German.) **The Effect of Rolling Speed on Rolling Pressure, Strength Properties, and Strip Thickness in Cold Rolling of Strip Steel.** Joseph Billigmann and Anton Pomp. *Stahl und Eisen,* v. 74, no. 8, Apr. 8, 1954, p. 441-461.

Experiments with five low-carbon openhearth steels indicate that pressure and thickness depend upon rate and lubrication of rolling. Form-change resistance and rise of strip temperature mutually compensate the effect of rolling rate. Tables, graphs. 102 ref. (F23, ST)

197-F. (German.) **Industrial Measurement of Wire Temperature on Multiple Drawing Machines.** Anton Zastera. *Stahl und Eisen,* v. 74, no. 8, Apr. 8, 1954, p. 461-464.

Rapid and trouble-free method of measuring temperatures of wire during drawing operation. Diagrams, tables, graphs. 8 ref. (F28)

198-F. (German.) **Present Status of Hot Working of Cast Iron.** Adalbert Wittmoser. *Zeitschrift für Metallkunde,* v. 45, no. 3, Mar. 1954, p. 127-136.

Shows that with proper methods most types of cast iron may be hot worked. Mechanical properties after treatments. Photographs, table, micrographs, graphs, diagrams. 32 ref. (F general, Q general, CI)

199-F. **Alloy Steel, Titanium Successfully Hot Extruded.** I. K. A. Wilhelm and G. A. Moudry. *Iron Age,* v. 173, Apr. 29, 1954, p. 98-102.

Studies on extrudability, extrusion temperature, heat treatment, lubricants and die design. Photographs, graph. (F24, Ti, AY)

200-F. **Foundation of Drop Hammers.** I. E. Katel. *Metal Treatment and Drop Forging,* v. 21, Apr. 1954, p. 161-167. (Translated from *Revue de Métallurgie,* June, 1953.)

Importance of guarding against transmission of tremors; various designs and constructions of foundations. Diagrams, table, photograph. 3 ref. (F22)

201-F. (Hungarian.) **Nomograms for Determination of Power Need of Rolling Trains.** Antal Buza. *Kohaszati Lapok,* v. 9, no. 3, Mar. 10, 1954, p. 115-122.

Reviews construction of linear nomograms of parallel scales. Applies method of reversing rolling trains. Diagrams. (F23)

202-F. (Pamphlet.) **Bibliography on Closed Die Forging.** 15 p. 1953. Loewy Construction Co., Inc., 350 Fifth Ave., New York 1, N. Y.

(F22)

203-F. (Book.) **Fundamentals of the Working of Metals.** G. Sachs. 166

p. 1954. Pergamon Press, Ltd., 242 Marylebone Rd., London, N.W. 1, England.

Intended for students and practical engineers, textbook is concise collection of basic facts of working metals by forging, rolling, drawing and other processes.
(F general, G general)

204-F. (Book.) **The Manufacture and Properties of Steel Wire.** Anton Pomp. 358 p. Wire Industry, 33 Furnival St., London, E.C. 4. 84s.

Wiredrawing and its auxiliary processes such as pickling, annealing, and patenting. (F28, ST)

205-F. **Powering the Fairless Works Two-Stand Tin Temper Mill.** C. H. Legler. *Blast Furnace and Steel Plant*, v. 42, May 1954, p. 521-523.

Design of drive mechanism for high-speed mill. Photographs, diagrams. (F23, CN)

206-F. **The Big Squeeze.** Earl Bush. *Instrumentation,* v. 7, no. 3, 1954, p. 4-6.

How Ugine-Sejournet extrusion process uses instrumentation to assure uniform billet temperatures. Photographs. (F24, ST)

207-F. **Titanium Successfully Hot Extruded. II.** K. A. Wilhelm and G. A. Moudry. *Iron Age,* v. 173, May 13, 1954, p. 126-129.

Extrudes better than steel. Die filling is improved, surface finish is good and die wear less. Dimensional tolerances for titanium extrusions will probably be comparable to present tolerances for hard aluminum alloy extrusions. Micrographs, graph, photographs.
(F24, Ti)

208-F. **The Diversity of Products of Low Individual Tonnages.** W. J. McClung. *Iron and Steel Engineer,* v. 31, Apr. 1954, p. 101-104.

General problem of wide variety of rolled sizes, shapes and grades involving low individual tonnage requirements. (F23, ST)

209-F. **Stainless Steel Wire Properties Are Affected by Draw Speed.** Samuel Storchheim. *Wire and Wire Products,* v. 29, May 1954, p. 522-523, 564-567.

Effects of cold reduction on properties of wire. Graphs, tables.
(F28, SS)

210-F. (Hungarian.) **Modern Drop Forging of Crankshafts.** Lajos Metes. *Kohaszati Lapok,* v. 9, no. 2, Feb. 1954, p. 72-73.

Advantages and methods of preforming pieces to be forged. Savings in raw material and better formation of flow lines. Photographs.
(F22, ST)

211-F. (Hungarian.) **Steels for Drop Forging. II.** Erno Weigl. *Kohaszati Lapok,* v. 9, no. 4, Apr. 10, 1954, p. 154-161.

Properties, composition and application of plain carbon and nickel steels for hot drop forging. Tables, graphs. (F22, CN, AY)

212-F. (Polish.) **Drop Forging Hammers.** Wieslaw Wroblewski. *Hutnik,* v. 21, no. 2, Feb. 1954, p. 41-48.

Advantages, limitations and various types of hammers. Power and impact forces. Diagrams, table.
(F22)

213-F. **The Theory and Practice of Wire Drawing. II. Researches Concerning Wire-Drawing Dies.** J. G. Wistreich. *Australasian Engineer,* 1954, Mar. 8, p. 61-66.

Recent investigations concerning die pressure, temperature, lubrication and wear. Methods of industrial control. Diagrams, tables. 66 ref. (F28)

214-F. **7,000-Ton Forging Press.** Hans Ulmann. *Engineering Journal,* v. 37, May 1954, p. 557-563.

Designed for production of large ingots and billets, as well as for forming heavy plate. Photographs, diagram. (F22, ST)

215-F. **Accurate Furnace Control Required in Processing of High Speed Steels.** F. A. Locke. *Industrial Heating,* v. 21, May 1954, p. 915-916, 918, 920.

Equipment for processing from ingot to final bar to avoid decarburization. (F21, TS)

216-F. **Calculation of Roll Pressure and Energy Consumption in Hot-Rolling.** Gunnar Wallquist. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 142-158.

Calculation may be based on mathematical analysis or on empirical values obtained experimentally. Table, diagrams, photographs, graphs. 43 ref. (F23, ST)

217-F. **Design Value of Extruded Steel.** S. O. Evans. *Machine Design,* v. 26, May 1954, p. 294-296, 299.

Abridged from "Steel Extrusion and Its Value to the Designer" presented at SAE National Passenger Car Body & Materials Meeting, Detroit, Mich., Mar. 1954. Mechanical limits, dimensional tolerances and economic considerations. Diagram. (F24, ST)

218-F. **The Forming of Aluminum Sheet. V. Drop-Hammer Forming.** H. Hinxman. *Sheet Metal Industries,* v. 31, no. 325, May 1954, p. 367-371, 377.

Economy of cost and time

achieved. Tools, dies and technique. Photographs, diagram. (To be continued.) (F22, Al)

219-F. The Rolling of Metals and Alloys. I. Historical Development of the Rolling Mill. Eustace C. Larke. *Sheet Metal Industries,* v. 31, no. 325, May 1954, p. 411-425.
Advantages associated with the use of small-diameter working rolls. Tables, photographs, diagrams. 19 ref. (To be continued.) (F23)

220-F. How to Hot Work Titanium. C. I. Bradford. *Steel,* v. 134, May 24, 1954, p. 100-101.
Ability to be worked with conventional steel mill equipment is largely responsible for rapid industrial growth. Photographs.
(F general, Ti)

221-F. Trends in Modern Forging. Robert G. Friedman. *Steel Processing,* v. 40, May 1954, p. 285-294, 331.
Improvements in hot and cold forging techniques. Photographs.
(F22)

222-F. (German.) **Fibrous Fracture and Piping in Extrusions.** A. Rühenbeck. *Metall,* v. 8, nos. 9-10, May 1954, p. 363-365.
Comparative strength tests and metallographic investigations on Al-Cu-Mg and Al-Cu-Mg-Pb alloys to determine cause of defects. Tables, photograph, micrographs.
(F24, Q26, Al, Cu)

223-F. Improvements in the Manufacture of Transformer Sheet. I. H. H. Meyer and H. Schlüter. *Engineers' Digest,* v. 15, May 1954, p. 199-202. (From *Stahl und Eisen,* v. 73, no. 26, Dec. 17, 1953, p. 1706-1717.)
Previously abstracted from original. See item 87-F, 1954.
(F23, D general, J23, ST)

224-F. A New Theory of Hot Rolling. George S. Mican. *Iron and Steel Engineer,* v. 31, May 1954, p. 55-71; disc., p. 72-79.
Tearing tendency, roll wear, roll breakage and power consumption reduced by knurled roll surface. Diagrams, photograph, tables, graphs. 15 ref. (F23, ST)

225-F. New Soaking Pit Facilities at Steel Division of Ford Motor Company. B. D. Barns and H. E. Raaflaub. *Iron and Steel Engineer,* v. 31, May 1954, p. 109-112; disc., p. 112-114.
Space problems encountered in expansion and steps taken to relieve them. Photographs. (F21, ST)

226-F. Aluminium Wire Manufacture. *Metal Industry,* v. 84, May 14, 1954, p. 416-418.
Production of aluminum and alloy rod and wire for engineering, aircraft and electrical industries. Complete range of bare aluminum conductors for overhead transmission and distribution of electricity. Photographs. (F27, F28, Al)

227-F. Aluminium Rolling, Extrusion and Drawing. M. J. Crowley, *Metal Industry,* v. 84, May 14, 1954, p. 419-420.
Production processes of plant manufacturing strong light alloys. Photographs. (F23, F24, G4, Al)

228-F. Copper, Brass and Zinc Rolling. *Metal Industry,* v. 84, May 14, 1954, p. 421-422.
Melting, refining, casting and rolling facilities of a particular plant. Photographs. 1 ref. (F23, Cu, Zn)

229-F. Wrought Light Alloys. R. T. Raven. *Metal Industry,* v. 84, May 14, 1954, p. 433-435.
Wrought alloys of aluminum and magnesium produced in forms of sheet, strip, extrusions, rod, bar, tube and wire. Photographs.
(F general, Al, Mg)

230-F. Extruded Blades. *Metal Progress,* v. 65, June 1954, p. 100-101.
Advantages favoring extruded over welded fabrication of propeller blades include greater strength and resistance to fatigue, lower production cost and greater output. Drawings. (F24)

231-F. Minimizing Cost of Forgings Requires Right Combination of Men, Materials, Machines. Holloway Kilborn and R. T. Herdegen, Jr. *SAE Journal,* v. 62, June 1954, p. 50-51.
Tips on worker's deafness, surface flaws, hammer dampers, induction heating and lubricants. (F22)

232-F. (French.) **Hot Torsion Testing in Relation to Manufacture of Seamless Tubes.** J. Dauvergne, M. Pélabon and J. Ivernel. *Revue de métallurgie,* v. 51, no. 4, Apr. 1954, p. 254-263; disc., p. 263-264.
Gamma-delta transformations of alloy steels causing serious defects in tubemaking. Tables, graphs, micrographs, photograph. 4 ref.
(F26, N8, AY)

233-F. (Hungarian.) **The Manufacture of Aluminum - Copper - Magnesium Plate. II.** E. Istvan Boczor. *Kohaszati Lapok,* v. 9, no. 2, Feb. 1954, p. 85-91.
Details of manufacturing process. Graphs, diagrams, tables. 9 ref.
(F23, Al, Cu, Mg)

234-F. (Book.) **The Closed Die Forging Process.** P. E. Kyle. 142 p. MacMillan Co., 60 Fifth Ave., New York 11, N. Y. $1.50.
Essential steps in production. Uses for products. (F22)

235-F. (Book.) **The Extrusion of Metals.** Claude E. Pearson. Revised re-

print. 206 p. 1953. Chapman and Hall, Ltd., 37 Essex St., London W. C. 2, England. 30s.

Standard reference book. Ugine-Sejournet process is mentioned. (F24)

236-F. (Book—Russian.) **New Researches in the Field of Forging Technology.** E. P. Unksov, editor. 195 p. 1950. Government Scientific-Technical Publishing House, Moscow.

Collection of seven articles. Experiments in forging, cold and hot upsetting of steels, cold forming and condition of steel as factor in forming. (F22, ST)

237-F. The Theory and Practice of Wire Drawing. III. The Problem of Rod Diameter. Clement Blazey and V. W. Benjamin. *Australasian Engineer,* 1954, Apr., p. 42-46.

Sizes for steel and aluminum. Experimental data for copper. Diagram, tables, graphs. 10 ref. (F28, ST, Al, Cu)

238-F. Consideration of Heating, Rolling and Annealing as Factors in the Control of Quality Cold Rolled Sheets. H. C. Smith. *Blast Furnace and Steel Plant,* v. 42, June 1954, p. 653-655.

Importance of various factors in production of quality sheets. (F23, J23, CN)

239-F. Forging and Hot Forming. II. George P. Holman. *Industrial Heating,* v. 21, June 1954, p. 1090 + 5 pages.

Heating phase in forging operations and automatic developments in continuous press forging. Tables. 6 ref. (F22, Al, Cu, Mg)

240-F. A Rolling-Mill Loadmeter. S. S. Carlisle and R. B. Sims. *Instruments and Automation,* v. 27, June 1954, p. 940-941.

Continuous measurement of load applied to rolls of strip mill. Photographs, diagrams, table. 5 ref. (F23)

241-F. High Production Mill Rolls Wide Magnesium Plate. W. G. Patton. *Iron Age,* v. 173, May 27, 1954, p. 111-114.

New 84-in. 4-high hot mill is used both for breakdown and semifinishing. No reheating required while rolling from 10 to 0.200 in. Photographs. (F23, Mg)

242-F. Aluminum Cold Forgings. R. A. Quadt. *Machine Design,* v. 26, June 1954, p. 156-160.

Methods and designs for high-volume production of high-strength parts. Photographs, table. (F22, Al)

243-F. A Description of the Plant of T. I. Aluminium Ltd. at Redditch. H. K. Lloyd. *Sheet Metal Industries,* v. 31, no. 326, June 1954, p. 485-507, 537.

Production of aluminum and alloy extrusions and tubes. Photographs, tables, micrographs. (F24, F26, Al)

244-F. Magnesium Widens Its Sheet Rolling Limits. Vance Bell. *Steel,* v. 134, June 7, 1954, p. 108-109.

Equipment and operation of mill for rolling magnesium. Photographs. (F23, Mg)

245-F. Giant Aluminum Ingots Pass Forge Test. W. S. Peterson and J. J. Wegner. *Steel,* v. 134, June 14, 1954, p. 138-139.

Forge pressing of 32x70-in. ingots into 13x42x85-in. plate blooms. Photographs, diagrams. (F22, Al)

246-F. Practice and Control for the Manufacture of High Carbon Commodity Wire. Robert H. Isenberg. *Wire and Wire Products,* v. 29, June 1954, p. 625-627, 666-668.

Patenting, drawing, galvanizing and tempering. Charts. (F28, L16, J25, J29, CN)

247-F. Observations on the Effects of Pre-Plating Hot Galvanized Steel Wire. H. H. Passlot and A. T. Baldwin. *Wire and Wire Products,* v. 29, June 1954, p. 632-634, 668-669.

Low-temperature coatings of lowest zinc-iron alloy content that would permit satisfactory re-forming of hot galvanized wire. Micrographs, tables, diagram. (F28, L16, ST)

248-F. Lubricant Carriers Used in the Drawing of High and Low Carbon Steel Wires. W. Lueg and Karl-Heinz Treptow. *Henry Brutcher, Altadena, Calif., Translation no.* 3244, 17 p. (Condensed from *Stahl und Eisen,* v. 72, no. 20, 1952, p. 1207-1212.)

Previously abstracted from original. See item 320-F, 1952. (F1, F28, ST)

249-F. Surface Defects in the Hot Working of Steel, Resulting From Residual Copper and Tin. K. Born. *Henry Brutcher, Altadena, Calif., Translation no.* 3255, 25 p. (Condensed from *Stahl und Eisen,* v. 73, no. 20, 1953, p. 1268-1277.)

Previously abstracted from original. See item 282-F, 1953. (F general, AY, Cu, Ni, Sn)

250-F. (French.) **Oval-Square Roughing Mills.** Petitfrere. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 5, 1954, p. 933-954.

Various designs for continuous and discontinuous trains. Diagrams, tables. (F23)

251-F. (French.) **Use of Steel Regenerators in Rolling Mill Heating Furnaces.** Trevoux. *Centre de Documen-*

tation Sidérurgique, Circulaire d'Informations Techniques, v. 11, no. 5, 1954, p. 955-974.

Types, regulation and safety devices. Photographs, diagrams. 10 ref. (F21, F23)

252-F. (Hungarian.) **Modern Pit-Heating Furnaces.** Laszlo Marosvary. *Kohaszati Lapok,* v. 9, no. 5, May 10, 1954, p. 193-207.

Reviews construction and operation of Hungarian, American, Russian and German furnaces. Diagrams. 13 ref. (F21)

253-F. Continuous Aluminium-Extrusion Press for Cable Sheathing. Important Advance in Cable Manufacture. *Engineering,* v. 177, June 18, 1954, p. 794-795.

Extrusion press and process. Diagrams, photographs, micrographs. (F24, Al)

254-F. Hot Forging and Rolling of Iron Castings. C. R. Austin. *Foundry,* v. 82, July 1954, p. 86-89, 244.

Effects on microstructure and mechanical properties. Micrographs, tables, graphs.
(F22, F23, M27, Q general, CI)

255-F. Repeaters in a Looping Mill. Practical Experience in Their Use. Hans Wilhelm Riddervold. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 292-294; disc., p. 332-338.

Use of cast iron repeaters without moving parts. Entry, exit and pipe guides. Photographs, diagrams. (F23, CI)

256-F. Swedish Rolling Mills. Use of Roller-Bearings in Mill Design. Axel Leufvén. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 298-301; disc., p. 332-338.

Bearing design, application and lubrication. Diagrams, photograph. (F23)

257-F. Use of Plastic, Castable and Gunning Materials in Soaking Pits. W. D. Rees. *Iron and Steel Engineer,* v. 31, June 1954, p. 59-63; disc., p. 63-67.

Use of these materials resulted in increased efficiency and lower costs. Tables, photographs. (F21)

258-F. Alcoa Starts Operation on Giant Extrusion Press. *Iron and Steel Engineer,* v. 31, June 1954, p. 119-120, 122.

Redesign of press and ingot heating and handling. Production experience. Photographs, tables. (F24, F21, Al)

259-F. Mills at Fairless Use New Methods. G. E. Farrington. *Iron and Steel Engineer,* v. 31, June 1954, p. 125-126.

Innovation involves use of two-high temper mill installed directly in pickle line. Photographs. (F23, ST)

260-F. Packaged Rolling Mill Aids Research. *Iron and Steel Engineer,* v. 31, June 1954, p. 129, 131.

Complete experimental strip, rod and wire mill in one machine. Photographs, table. (F23)

261-F. The Falkirk Rolling Mills of the British Aluminium Company Limited. *Light Metals,* v. 17, June 1954, p. 173-188.

Equipment, plant layout and operating procedures. Melting furnaces, rolling mills heat treating furnaces, finishing and grinding equipment. Photographs.
(F23, F21, J general, G general, Al)

262-F. Extruded Aluminium Sheaths for Power Cables. *Metal Industry,* v. 84, June 11, 1954, p. 507-508.

Extrusion equipment. Photographs, diagram, micrographs. (F24, Al)

263-F. Giant Press Opens New Era for Extrusions. *Modern Metals,* v. 10, June 1954, p. 74-76.

Giant 14,000-ton extrusion press capable of extruding four times the weight of aluminum previously possible in one "squeeze". Opens new horizons for extrusion designer. Photographs, diagrams. (F24, Al)

264-F. Forging. *Western Metals,* v. 12, June 1954, p. 86, 88.

Bay area custom forge shop diversifies operations, develops unique tractor. Photographs.
(F22, ST, Cu, Al)

265-F. (German.) **Steel for Radially Stressed Heavy Forgings.** Otto Krifka. *Stahl und Eisen,* v. 74, no. 12, June 3, 1954, p. 760-768.

Potential defects and their prevention, ultrasonic tests, ingot casting rates in relation to temperature. Tables, micrographs, photographs, graph. 15 ref. (F22, D9, S13, ST)

266-F. (German.) **Hot-Working of Light Metals.** Fritz Plattner. *Zeitschrift für Metallkunde,* v. 45, no. 5, May 1954, p. 253-256.

Rolling and extrusion. Graphs, diagrams, photographs. 2 ref. (F23, F24, Al)

267-F. Park Gate Iron and Steel Company. 11-In. Continuous Bar Rolling Mill. *Engineering,* v. 177, June 25, 1954, p. 818-821.

Equipment, plant layout and operating procedures. Photographs, diagram. (F23, ST)

268-F. Production of Aluminium Plate and Sheet. *Engineering,* v. 177, June 25, 1954, p. 822-824.

Facilities of Falkirk works of the British Aluminium Co. Inc., including equipment for materials handling, rolling, coiling, annealing and anodizing. Photographs. (F23, F28, J23, L19, A5, Al)

269-F. **Methods of Wire Production.** K. V. Aiyer. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 95-110.

Survey of recent advances in wire-drawing machines, lubricants and dies. Photographs, diagrams, graphs, tables. 7 ref. (F28, F1)

270-F. **Forgeability of Steels With Varying Amounts of Manganese and Sulphur.** C. Travis Anderson, V. V. Donaldson, Robert W. Kimball and Francis R. Cattoir. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, July 1954, p. 835-837.

Tests on series of high-purity Fe-C alloys with carefully controlled additions of sulfur and manganese. Graph, table. (F22, CN)

271-F. **Heavy Presses Near Completion.** Arthur H. Allen. *Metal Progress,* v. 66, July 1954, p. 81-85.

Design and construction progress of hydraulic forging presses of 18,-000, 35,000 and 50,000-ton capacity. Photographs, tables. (F22, Al)

272-F. (Czech.) **Development of Rolling Theory.** Fr. Wiesner. *Hutnické Listy,* v. 9, no. 5, 1954, p. 258-268.

Effects of temperature, rolling speed and composition of steel. Difficulties in obtaining valid formulas. Tables, graphs, diagrams, photographs. 18 ref. (F23, ST)

273-F. (French.) **Commission of Engineers for the Utilization of Fuels and of Rolling Mills for Special Steels. I. The Heating of Rolling-Mill Furnaces.** Hautcolas. **II. Regenerators.** Szczeniowski. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 6, 1954, p. 1129-1157.

Fuel oil heating, utilization of waste heat, economy and construction problems. Diagrams. Photographs. (F1, F23, Fe)

274-F. (Russian.) **Investigation of Forging, Stamping and Rolling of Cast Iron With Spheroidal Graphite.** E. P. Unksov and D. I. Berezhkovskii. *Vestnik Machinostroeniia,* v. 33, no. 12, Dec. 1953, p. 29-35.

Results of workability investigations. Graphs, photographs, micrographs. 5 ref. (F22, F23, G3, CI)

275-F. (Book.) **Instrumentation and Control of Mill Furnaces.** 34 p. British Iron and Steel Research Association, 11 Park Lane, London, W.1, England. 5s.

Selection, installation, maintenance, and operation of instruments for rolling mill furnaces. (F23, F21, S16, S18)

276-F. **Fairless Works — Electric Equipment for Slabbing Mill and Blooming Mill.** R. H. Wright and N. L. Kincaid. *Applications and Industry,* 1954, no. 13, p. 141-143; disc., p. 143-144.

Description of drives and circuits. Diagrams. (F23, ST)

277-F. **Researches in Surface Friction in Cold Rolling.** P. W. Whitton. *Australian Journal of Applied Science,* v. 5, June 1954, p. 155-177.

Mean values of the coefficient of surface friction between metal strip and smooth work rolls, both with and without lubrication. Diagrams, photographs, graphs, tables. 12 ref. (F23, Q9, CN, Cu)

278-F. **The Influence of Soluble Oils on Surface Finish in the Hot Rolling of Aluminium and Its Alloys.** H. A. Snow. *Sheet Metal Industries,* v. 31, no. 327, July 1954, p. 601-608.

Effects of wetting properties and emulsion stability. Photographs, graphs. 5 ref. (F23, F1, Al)

279-F. **Determination of Correct Wire Tensions.** Erwin J. Saxl. *Wire and Wire Products,* v. 29, July 1954, p. 752-753.

Shows effect of tension in wire drawing, coating, or insulating. Provides a table of safe operating tensions for any particular operating condition. Photograph, table. (F28, Cu)

280-F. **Marshall Richards Tube-Drawing Machinery.** *Wire Industry,* v. 21, July 1954, p. 703, 707.

A versatile horizontal bull block. Photographs. (F26)

281-F. (German.) **Forging and Hot Pressing of Light Metals With Electron Metal Dies.** B. Preuss. *Metall,* v. 8, nos. 13-14, July 1954, p. 540-541.

Comparison of production costs with different dies. Diagrams, tables. (F22, Al)

282-F. (German.) **Spreading in Flat Rolling of Round Wire and Determination of Cross-Section Shapes.** Werner Lueg and Karl-Heinz Treptow. *Stahl und Eisen,* v. 74, no. 14, July 1, 1954, p. 881-888.

Effect of carbon content and pressure. Tables, graphs, micrographs, diagrams. 7 ref. (F28, ST)

283-F. (Russian.) **Distribution of Power in Roll Stand Mechanism With Unequal Peripheral Roll Speeds.** A. A. Nikitin. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 18-23.

Theoretical treatment of torque

distribution. Diagrams, tables. 2 ref. (F23)

284-F. (Russian.) **The Distribution of Torque in Rolling Mill Rolls.** A. I. Tselikov. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 23-24.

Effects of unequal roll speeds and pressures. Diagrams. (F23)

285-F. Australian Developments in Drawn-Galvanised Rope Wires. F. W. Welshman and C. James. *Australasian Engineer,* 1954, May, p. 43-47.

Preparation and properties of galvanized wires for ropes. Effect of various methods of coating on properties of the wire. Tables, diagrams, micrographs, graphs. (F28, L16)

286-F. Surface Friction Investigations in Cold Rolling. P. W. Whitton. *Australasian Engineer,* 1954, May, p. 54-62.

Friction coefficients obtained by measurements of torque per roll, total roll separating force, back tension applied and forward slip of the rolled strip. Diagrams, photographs, tables, graphs. 9 ref. (F23, Q9, Al, CN, Cu)

287-F. Wire Straightening and Molding for Wire Spring Relays. A. J. Brunner, H. E. Cosson and R. W. Strickland. *Bell System Technical Journal,* v. 33, July 1954, p. 859-884.

Straightening of large quantities of small diameter wire and molding of a multiplicity of straightened wire inserts into phenolic resin blocks. Photographs, diagrams. (F29)

288-F. Aluminium Strip, Sheet and Plate Mill at Resolven. *Engineer,* v. 198, July 9, 1954, p. 46-49.

Buildings, equipment and plant layout. Operation of mill hot line. Photographs, flowsheet. (To be continued.) (F23, Al)

289-F. Some Factors Affecting the Quality of Extrusions. I. Christopher Smith and Norman Swindells. *Industrial Heating,* v. 21, July 1954, p. 1316 + 3 pages.

Effect of billet quality and preheating furnace variables on aluminum and copper extrusions. (To be continued.) (F24, Al, Cu)

290-F. Combination Bar and Rod Mill—Los Angeles Plant. C. C. Brandt and Phillip Scarola. *Iron and Steel Engineer,* v. 31, July 1954, p. 72-78.

Market conditions on West Coast have resulted in a demand for unusual flexibility. Photographs, tables, graphs, diagrams. (F23, F27, ST)

291-F. Electric Systems for Main Drives. W. E. Miller. *Iron and Steel Engineer,* v. 31, July 1954, p. 83-94; disc., p. 94-97.

Advancements in the engineering of electrical mill equipment increases production and gives better control and quality. Photographs, diagrams, graphs, tables. (F23)

292-F. Trends in Recent Cold Mill Installations. R. E. Noble. *Iron and Steel Enjineer,* v. 31, July 1954, p. 105-116.

Advancement of operation to meet demands for speed and power. Graph, photographs, diagrams. (F23)

293-F. Extruded Pistons. *Modern Metals,* v. 10, July 1954, p. 82.

Stronger, lighter, cheaper aluminum pistons. Photograph. (F24, T7, Al)

294-F. The Rolling of Metals and Alloys. II. Principles Underlying the Design, Use and Reproduction of Roll Cambers. E. C. Larke. *Sheet Metal Industries,* v. 31, no. 327, July 1954, p. 611-618, 620.

Importance of roll cambering on gage uniformity across width of strips, determination of shape and amount of cambers for cold rolling. Diagrams, graphs, photographs, tables. 13 ref. (To be continued.) (F23)

295-F. The Canton Forge Plant of the Ford Motor Company. H. E. Trout, Jr. *Steel Processing,* v. 40, July 1954, p. 421-436, 467.

Production engineering, quality control, metallurgy, industrial relations and utilities. Photographs, diagram, table. (F22)

296-F. Automatic Presses. T. W. Bannon. *Steel Processing,* v. 40, July 1954, p. 437-438, 470.

Development of automatic methods of handling parts and materials during production process. Photographs. (To be continued.) (F22, G1)

297-F. Upset Integral End Fittings for Thin-Walled Tubing. Gilbert C. Close. *Western Machinery and Steel World,* v. 45, July 1954, p. 92-95.

Application of method to forming ends of tubes. Photographs. (F26)

298-F. The Steel Mill Goes Modern. *Finish,* v. 11, Aug. 1954, p. 33-37, 66.

Expansion and improvement program of Youngstown Sheet and Tube Co. Photographs, diagrams. (F23, ST)

299-F. Cable Sheathing by Direct Extrusion. *Light Metals,* v. 17, July 1954, p. 214-215.

Equipment and operating procedures for extruding sheaths of high

and commercial purity aluminum. Photographs, micrographs, diagram. (F24, Al)

300-F. Hydraulic Problems of Large Forging Presses. E. V. Crane and W. R. Jackson. *National Conference on Industrial Hydraulics, Proceedings of the 9th Meeting,* v. 7, 1953, p.56-69.
Overdrive vs. underdrive, hydraulic media, accumulator systems. Photographs, diagrams, graphs. (F22)

301-F. Self Contained Pump Units as Applied to Extrusion Presses. Adolphe J. de Matteo. *National Conference on Industrial Hydraulics, Proceedings of the 9th Meeting,* v. 7, 1953, p. 70-80.
Design of hydraulic control circuits for brass and aluminum extruders. Photographs, diagrams. (F24, Al, Cu)

302-F. Trends in Forging. Robert G. Friedman, *Tool Engineer,* v. 33, Aug. 1954, p. 145-147.
Advancements in forging blank preparation, precision press forging, horizontal deep piercing and cold forging. Photographs. (F22)

303-F. (German.) **Laboratory Scarfing of Rolled Billets.** Egon Ritter. *Stahl und Eisen,* v. 74, no. 15, July 15, 1954, p. 957-959.
Equipment and test results. Photographs. (F21, ST)

304-F. Mile a Minute Rod Mill. D. L. Siegelin. *Blast Furnace and Steel Plant,* v. 42, Aug. 1954, p. 928-933.
Equipment and operating procedures. Photographs, diagrams, table. (F27, CN)

305-F. Rare Earths Counteract Hot Rolling Defects in Stainless Steel. R. H. Henke and R. A. Lula. *Journal of Metals,* v. 6, Aug. 1954, p. 883-888.
Behavior of martensitic, ferritic and austenitic steel with respect to conversion of ingots into hot rolled semifinished products. Micrographs, tables, graphs, photograph. 1 ref. (F23, B22, SS)

306-F. Stock Straighteners Come of Age. William Hyams. *Machine and Tool Blue Book,* v. 49, June 1954, p. 151-158.
Methods and equipment for straightening tubing. Photographs. (F29)

307-F. Stretching Hot-Rolled Bars Produces Cold-Drawn Properties. J. A. Helget. *Machinery,* v. 60, Aug. 1954, p. 162-164.
Development, operation and features of a bar-stretching machine. Photographs. (F29, ST)

308-F. In-Process Machining of Large Aluminum Forgings. Alfred H. Petersen. *Metal Progress,* v. 66, Aug. 1954, p. 81-88.
Analysis of problems encountered in production of large forgings. Recommends rough machining after blocking and before finish forging. Graphs, photographs, diagrams, table. (F22, G17, Al)

309-F. The Rolling of Metals and Alloys. II. Principles Underlying the Design, Use and Reproduction of Roll Cambers. E. C. Larke. *Sheet Metal Industries,* v. 31, no. 328, Aug. 1954, p. 699-703.
Calculation of required camber, approximate formulas. Diagrams, tables, graph. 3 ref. (To be continued.) (F23)

310-F. Forging Titanium—A Prescription for Production Headaches. James J. Russ. *Steel,* v. 135, Aug. 16, 1954, p. 100-101.
Critical check points are design, die sinking and raw materials. Material, though sluggish, evidences normal flow characteristics. Tendency is to extrude through thin sections. Photographs. (F22, Ti)

311-F. The Importance of Lime in Wire Drawing. Thomas C. Miller. *Wire and Wire Products,* v. 29, Aug. 1954, p. 843 + 8 pages.
Characteristics and uses of various types of lime. Tables. 3 ref. (F28)

312-F. Wire Flattening—An Appraisal of Today's Theory and Practice. I. Wire Flattening Theory. A. I. Nussbaum. *Wire and Wire Products,* v. 29, Aug. 1954, p. 857-859, 916-917.
Methods of determining spread, wire size and mill power requirements. Graphs. (F29)

313-F. The Production of Fine Tungsten Wire. *Engineering,* v. 178, Aug. 6, 1954, p. 174-178.
Chemical processes and mechanical operations in manufacture. Similar applications to molybdenum. Photographs. (F28, W, Mo)

314-F. Some Factors Affecting the Quality of Extrusions. II. Christopher Smith and Norman Swindells. *Industrial Heating,* v. 21, Aug. 1954, p. 1518 + 4 pages.
Press design, tools, effect of extrusion speed. Table, diagram. (To be continued.) (F24, Al, Cu)

315-F. The Calculation of Roll Force and Torque in Hot Rolling Mills. R. B. Sims. *Institution of Mechanical Engineers, Proceedings,* v. 168, no. 6, 1954, p. 191-200.
Equations derived for normal pres-

sure, specific roll load and torque in hot rolling mills, using the condition for plastic deformation in rolling derived by Orowan, together with von Karman's equation of equilibrium. Tables, graphs, macrograph, photograph. 13 ref. (F23, Q24)

316-F. Measurement and Analysis of Rolling Loads in a Large Hot Plate Mill. R. Stewartson. *Institution of Mechanical Engineers, Proceedings,* v. 168, no. 6, 1954, p. 201-208; disc., p. 209-214.

Load indications for plates of different sizes analyzed and compared with three roll load formulas. Tables, photograph, graphs, diagrams. 5 ref. (F23)

317-F. Portable Plug-In Elements Heat Magnesium Forming Dies. R. W. Peters. *Iron Age,* v. 174, Aug. 12, 1954, p. 112-113.

' Use of rod-type resistance heaters results in lower costs and increased efficiency and saftey. Photographs. (F21, Mg)

318-F. Internal Temperature Distribution in the Cooling and Reheating of Steel Ingots. R. J. Sarjant and M. R. Slack. *Iron and Steel Institute, Journal,* v. 177, Aug. 1954, p. 428-444.

Relation of track time and reheating practice to thermal efficiency and temperature saturation necessary for good rolling based on thermal history calculations. Diagrams, tables, graphs. 32 ref. (F21, ST)

319-F. Controls and Safety Devices of Heavy Presses. E. V. Crane and W. R. Jackson. *Mechanical Engineering,* v. 76, Aug. 1954, p. 636-639.

Particular reference made to the Air Force 25,000-ton capacity press. Diagrams. (F22, A7)

320-F. Forging of Aircraft Gas Turbine Blades. L. M. Raring. *Steel Processing,* v. 40, Aug. 1954, p. 487-494, 526.

Raw material inspection, forging sequence, heat treatment, finishing and testing. Photographs. (F22, J general, L general, S general, SS)

321-F. New 14,000 Ton Extrusion Press in Operation. *Steel Processing,* v. 40, Aug. 1954, p. 495-499, 528.

Design of press, production experience and auxiliary processing of aluminum extrusions. Diagrams, photographs, table. (F24, Al)

322-F. The Use of High-Frequency Current for the Through Heating of Steel Bars. V. P. Vologdin. *Henry Brutcher, Altadena, Calif., Translation no.* 3288, 15 p. (Condensed from *Izvestiya Akademii Nauk SSSR,* 1953, no. 1, Jan., p. 3-15.)

Applications of induction heating frequencies used for various bar sizes and current sources. Table, photographs. (F21, ST)

323-F. (French.) **Researches on a Defect That Appears in the Rolling of 67:33 Brass (Phantom Lamination).** Jean R. Maréchal. *Revue de métallurgie,* v. 51, no. 7, July 1954, p. 441-458.

Cracks which appear only on thick sheets (above several mm.) and disappear on further work (cold rolling with intermediate anneals) are caused by secondary formation of beta phase. Photographs, micrographs, tables, diagram. 6 ref. (F23, Cu)

324-F. (Japanese.) **Copper Alloy Extrusion and Drawing.** S. Yamaguchi. *Metals (Japanese),* v. 24, no. 7, July 1954, p. 520-523.

Techniques. Mechanical characteristics of pipes and other extruded products. Diagrams, tables. 6 ref. (F24, Q general, Cu)

325-F. Wire Drawing Lubricants (Practical Lubrication No. 14). L. Salz. *Lubrication Engineering,* v. 10, July-Aug. 1954, p. 190-192.

Reviews practices for ferrous and nonferrous applications. Table. (F1, F28)

326-F. On the Development of Cracks in the Rotary Swaging of Steel Wire. W. Püngel. *Henry Brutcher, Altadena, Calif., Translation no.* 2834, 3 p. (From *Stahl und Eisen,* v. 71, no. 22, 1951, p. 1137-1140.)

Previously abstracted from original. See item 22-F, 1952. (F28, ST)

327-F. How to Understand Cold Working of Metals. Samuel Storchheim. *American Machinist,* v. 98, Aug. 30, 1954, p. 101-108.

Effects of processing operations on microstructure and properties. Micrographs, graphs, diagrams, photographs. (F general, G general, M27)

328-F. The 11-In. Continuous Bar Mill at the Roundwood Works of the Park Gate Iron & Steel Company, Limited. *British Steelmaker,* v. 20, Aug. 1954, p. 310-318.

Equipment, plant layout and operating procedures. Photographs, diagrams, tables. (F23)

329-F. Recent Rolling Mill Practices Indicate Trend of Future Investigations. N. H. Polakowski. *Journal of Metals,* v. 6, Sept. 1954, p. 954-958.

Practical and theoretical aspects of rolling metals with various types

of equipment. New mill designs. Photographs, graphs. 32 ref. (F23)

330-F. Method of Sheathing Power Cables With Aluminium. *Machinery (London),* v. 85, Aug. 20, 1954, p. 391-392.

New press for continuous extrusion to any length. Photograph, diagram. (F24, Al)

331-F. Wire Flattening. A Lower-Cost Narrow Strip Producer. A. I. Nussbaum. *Steel,* v. 135, Sept. 6, 1954, p. 104, 106, 109.

Equipment and techniques for producing close tolerance strip. Photographs, diagram. (F29)

332-F. Die Design. How to Save Development Time. Bernard K. H. Bao. *Tool Engineer,* v. 33, Sept. 1954, p. 65-68.

Use of the Pappus (or Guldinus) theorem to calculate necessary dimensions of draw or extrusion dies. Diagrams. (F24, G4)

333-F. Old Ways and New. J. F. Mayberry and T. G. Lutz. *Welding Engineer,* v. 39, Sept. 1954, p. 36-38.

Description and use of a four-side hot slab scarfing machine. Photographs, table. (F21)

334-F. (French.) **Glass Is a Lubricant in Metallurgical Operations.** Ivan Peyches and J. Séjournet. *Verres et réfractaires,* v. 8, no. 3, May-June 1954, p. 131-135.

Use of glass as a lubricant in the extrusion of steel. Photographs, diagrams, graph. (F1, F24, ST)

335-F. (German.) **Possibilities in the Mathematical Determination of the Flow Process in Standard Rolled Shapes.** Z. Wusatowski and R. Wusatowski. *Metallurgie und Giessereitechnik,* v. 4, no. 7, July 1954, p. 295-307.

Simplified method computes applied pressure and flow of steel in lateral and longitudinal directions and designs new rolls. Diagrams, nomograms, tables. 10 ref. (F23, ST)

336-F. (German.) **Principles of Synchronizing Continuous Rolling Trains and Computing Rolling Rates.** Z. Wusatowski. *Metallurgie und Giessereitechnik,* v. 4, no. 7, July 1954, p. 308-310.

Mathematical analysis. Tables. 5 ref. (F23)

337-F. (German.) **The New Wire-Drawing and Billet-Rolling Mill of the N.V. Netherlandsche Kabelfabrieken, Delft.** Georg Leder. *Stahl und Eisen,* v. 74, no. 17, Aug. 12, 1954, p. 1076-1079.

Description. Photographs, diagrams. 2 ref. (F28, F23, ST)

338-F. (French.) **Furnaces for Large Forgings.** J. E. Lafon. *Metallurgie et la construction mécanique,* v. 86, nos. 7-8, July-Aug. 1954, p. 585, 587-591.

Improvements in tunnel and batch-type heating equipment. Diagrams. (F21, F22)

339-F. Surface Temperature—Lubrication Relations During Drawing of Copper Wire. J. S. Hoggart. *Australasian Engineer,* 1954, June, p. 44-50.

By means of a thermocouple die the surface temperature attained by a copper wire during drawing was determined over a range of speeds from 26 to 1280 ft. per min., for three different lubricants. Graphs, diagrams, tables. 11 ref. (F28, F1, Cu)

340-F. The Effect of Surface Temperatures Attained During Drawing on the Tensile Strength of Copper Wire. J. S. Hoggart and S. Z. M. Kopczynski. *Australasian Engineer,* 1954, June, p. 50-53.

Relationship explained in terms of stress distribution and theory of flow and fracture. Graphs, table, diagram. 6 ref. (F28, Q23, Cu)

341-F. Driving and Controlling Wire Drawing Machines. I. J. Raymond Erbe and H. A. Dickerson. *Blast Furnace and Steel Plant,* v. 42, Sept. 1954, p. 1048-1052.

Development and operation of modern wire drawing equipment. Photographs. (F28)

342-F. Sendzimir Planetary Hot Mill. John H. Mort. *Iron & Steel,* v. 27, Sept. 1954, p. 451-455.

Mathematical observations on operation. (To be continued.) (F23)

343-F. Seamless Tubes. D. E. Brooks. *Iron & Steel,* v. 27, Sept. 1954, p. 459-461.

Production methods. Photographs. 6 ref. (F26, ST)

344-F. Tension Regulator on Kaiser Temper Mill. W. R. Harris and L. F. Stringer. *Iron and Steel Engineer,* v. 31, Aug. 1954, p. 71-77; disc., p. 77-78.

Magnetic amplifier application and its operating results. Photographs, diagrams, graphs. (F23)

345-F. Recent Advancements in Continuous Butt and Induction Weld Pipe Mills. William Rodder. *Iron and Steel Engineer,* v. 31, Aug. 1954, p. 108-115; disc., p. 115-117.

New mill layouts and changes in design of equipment have made possible increased pipe speeds. Photographs, diagrams, tables. (F26, CN)

346-F. Modernization of Skelp Mill at Wheeling Steel's Benwood Works.

S. W. Crisman. *Iron and Steel Engineer,* v. 31, Aug. 1954, p. 148-150.
Method of coping with problem when capacity of pipe mills becomes greater than supply of skelp. Photographs, diagram, graph, table. (F26, A5, CN)

347-F. Steel Mill Lubrication Problems. A. C. Keiser, Jr., E. E. Perso, W. H. Mandy and M. S. Clark. *Iron and Steel Engineer,* v. 31, Sept. 1954, p. 177-182; disc., p. 182-184.
Effects of water, scale, dirt, and operating variables on various lubricants. Tables, diagrams. (F1)

348-F. Helper Drives Help Steel Processing Lines. E. E. Vonada. *Iron and Steel Engineer,* v. 31, Sept. 1954, p. 192-196; disc., p. 196.
Auxiliary equipment in rolling mills. Photograph, diagrams. (F23)

349-F. Two-High/Four-High Combination Mill Aids Rolling Research. A. I. Nussbaum. *Iron and Steel Engineer,* v. 31, Sept. 1954, p. 199, 202, 205.
Experimental equipment for study of rolling problems. Photographs, tables. (F23)

350-F. New Combination Rod Mill Will Develop High Speed. A. F. Kenyon. *Iron and Steel Engineer,* v. 31, Sept. 1954, p. 210, 212.
Mill to produce steel rod from 0.205 to 1⅛ in. in diameter. Table, diagram. (F27, CN)

351-F. Calculation of Roll Force and Torque in Cold-Rolling by Graphical and Experimental Methods. R. B. Sims. *Iron and Steel Institute, Journal,* v. 178, Sept. 1954, p. 19-34 + 6 plates.
Derivation of equations and experimental verification for various rolling problems. Graphs, photograph, diagrams, tables. 19 ref. (F23)

352-F. Precision Forging Stainless Steel Compressor Blades for Gas Turbines. *Machinery (London),* v. 85, Aug. 27, 1954, p. 419-429.
Technique and advantages of process in producing to close tolerances a large number of blades. Production and servicing of forging dies. Photographs. (F22, T25, SS)

353-F. The Ugine-Sejournet Process for the Hot Extrusion of Steel. *Machinery (London),* v. 85, Sept. 3, 1954, p. 471-480.
Early developments, use of glass lubricant and presses and associated equipment. Photographs, diagrams, table. (F24, ST)

354-F. Rolled Extrusion of Thin-Walled Parts. W. N. Parker. *Machinery (London),* v. 85, Sept. 3, 1954, p. 484-487.
Process and typical applications. Diagrams, photograph. (F24)

355-F. Aluminium Alloy Forgings. L. Fletcher. *Metal Industry,* v. 85, Sept. 3, 1954, p. 185-188.
Typical forgings, alloy and size limitations, cost comparisons, and future developments. Photographs. (F22, Al)

356-F. How to Machine Stainless Steels. II. Lester F. Spencer. *Modern Machine Shop,* v. 27, Sept. 1954, p. 132-142.
Reaming, tapping and threading, milling operations, broaching, and typical work jobs. Photographs, diagrams. (G17, SS)

357-F. Aluminum Extrusions Faster, Better, Cheaper. C. B. Huizenga. *Modern Metals,* v. 10, Sept. 1954, p. 82, 84.
Economy of producing special shapes by manufacturers of architectural products. Photographs. (F24, T26, Al)

358-F. Glass Lube Greases Way for Steel Extrusion. S. O. Evans. *SAE Journal,* v. 62, Sept. 1954, p. 35-39.
French process extends three-way gain to designers and offers economic advantages. Diagrams, table. (F1, F24, ST)

359-F. The Rolling of Metals and Alloys. II. Principles Underlying the Design, Use and Reproduction of Roll Cambers. E. C. Larke. *Sheet Metal Industries,* v. 31, no. 329, Sept. 1954, p. 781-791.
Design principles for various rolling mills. Tables, diagrams, photograph, graph. (To be continued) (F23)

360-F. Counterblow Hammer vs. Drop Hammer, a Comparison. J. L. Lebach and Eli Sammett. *Steel Processing,* v. 40, Sept. 1954, p. 557-563.
Counterblow hammers shown to be more efficient and require less maintenance. Tables, graphs, diagram. 5 ref. (F22, ST)

361-F. Air Power for Metalworking. V. Using Air as a Tooling Component. William E. Hoffman. *Tooling and Production,* v. 20, Sept. 1954, p. 57-61, 168.
Applications of compressed air in forging, milling and riveting operations. Diagrams. (F22, G17, K13)

362-F. Wire Flattening—an Appraisal of Today's Theory and Practice. II. Wire Flattening Practice. A. I. Nussbaum. *Wire and Wire Products,* v. 29, Sept. 1954, p. 961-965, 1033.
Design and operation of modern mill equipment. Photographs, diagram. (F29)

363-F. (English.) **Drawing Force Through Die. Circular Arc-Type Die and Straight-Line Type Die.** Hiroshi Yamanouchi and Ikuhiko Hayashi. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 50-52.

Theoretical and experimental determinations on mild steel rod. Diagrams, graph. (F27, CN)

364-F. (Polish.) **Comparison of Calculation Methods of Roll Pressure in Hot Rolling Process.** Z. Wusatowski and S. Bala. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 3, 1954, p. 120-132.

Factory measurements used to evaluate various calculating schemes. Graphs, tables. 12 ref. (F23, ST)

365-F. Drawbench for Large Aluminium Alloy Tubes. *Engineer,* v. 198, Sept. 10, 1954, p. 356-358.

Machine adapted for both plug and mandrel drawing produces tubes from 4 in. to 17 in. diameter. Photographs, diagrams. (F26, Al)

366-F. International Nickel Expands Facilities for Producing Cold Drawn Rods and Tubes. *Industrial Heating,* v. 21, Sept. 1954, p. 1726-1728, 1730.

New section extends length limitations on rods and tubes and triples capacity for producing heat exchanger tubes. Photographs. (F26, F27, Ni)

367-F. Sixty-Cycle Induction Heating of Large Steel Sections for Hot Forming. C. H. Hartwig. *Industrial Heating,* v. 21, Sept. 1954, p. 1732, 1734, 1880, 1882.

Theory of induction heating, experimentation, coil description. Graphs, photograph, diagram. (To be continued.) (F22, G1, J2, S2)

368-F. Carbides—Advantages and Limitations. C. H. Good. *Machinery (London),* v. 85, Sept. 10, 1954, p. 573-575.

Composition, properties, application and future of carbides in wire-drawing dies. Photographs, micrographs, graph. (F28, C-n)

369-F. (English.) **Precision Measurement of Wire Drawing Dies.** Tadashi Hisamoto and Kimio Kakizaki. *Hitachi Review,* 1954, no. 6, July, p. 127-133.

Form and measurement of dies, measurement of die angle, hole surface roughness and die hole circularity, application of circularity measurement method. Tables, diagrams, micrograph, photograph, graphs. 12 ref. (F28)

370-F. (German.) **Reconstruction of a 550-MM. Staggered Roll Train by Joining a Separate Continuous Roll Line for Rolling Hot Strip and Tube Strips.** Herbert Müller. *Stahl und Eisen,* v. 74, no. 18, Aug. 26, 1954, p. 1132-1136.

Equipment for continuous rolling of tube strip. Diagrams, photographs, table. (F26, CN)

371-F. (German.) **Standardizing Extrusion Press Tools.** Kurt Laue and Matthias Arenz. *Zeitschrift für Metallkunde,* v. 45, no. 8, Aug. 1954, p. 461-464.

Reasons and recommendations for standardization of equipment. Graphs, tables, diagrams. (F24)

372-F. (German.) **The Sendzimir Cold-Strip Rolling Mill.** Heinrich Bischoff. *Zeitschrift für Metallkunde,* v. 45, no. 8, Aug. 1954, p. 464-468.

Design and examples of use in rolling steel and nonferrous metals. Diagrams, photographs. (F23)

373-F. Quality Control in Wire Drawing. O. Herrmann. *Engineers' Digest,* v. 15, Sept. 1954, p. 369-371. (From *Draht,* 1954, no. 23, June, p. 26-30.)

Drawing-force indicator which informs operator of any variations in drawing conditions, thus insuring uniform quality, facilitates inspection and shows whether a new drawing die works satisfactorily in existing set-up. Graphs, diagram. (F28)

374-F. Elimination of Stretcher Strains in Mild-Steel Pressings. B. B. Hundy. *Iron and Steel Institute, Journal,* v. 178, Oct. 1954, p. 127-138 + 1 plate.

Study of residual stresses developed by temper rolling, roller leveling and stretching. High macroscopic and microscopic stresses are desirable. Graphs, micrograph, diffraction patterns. 23 ref. (F23, F29, G9, Q25, CN)

375-F. Relationship Between Drop-Forging Accuracy and Subsequent Machining Operations. K. Lange. *Metal Treatment and Drop Forging,* v. 21, Sept. 1954, p. 407-410, 412.

Influence of material, metal cutting technique, forging design and clamping technique on the allowances and tolerances made in design and accuracy of a forging for final machining. Diagrams, graphs. 6 ref. (F22, G17)

376-F. Why Electric Soaking Pits Are Used. Horace Drever. *Steel,* v. 135, Oct. 4, 1954, p. 100, 102.

Advantages include better surface finish, more uniform rolling, decarb controlled and less floor space required. Diagrams, photograph. (F21, ST)

377-F. Trends in Modern Forging. Robert G. Friedman. *Steel,* v. 135, Oct. 11, 1954, p. 118-119.

Developments which have permitted forging operations to be included in production lines. Photographs. (F22)

378-F. Speed Versus Output in Wire-Drawing. N. Davidson. *Wire Industry,* v. 21, Sept. 1954, p. 914, 917, 919.

Design of wiredrawing equipment, gravity blocks, light versus heavy drafting and producing on spools. (F28)

379-F. (German.) **Modern Machines for Deseaming Steel Ingots and Semi-Finished Products.** Hermann Hüber. *Stahl und Eisen,* v. 74, no. 19, Sept. 9, 1954, p. 1185-1192; disc., p. 1192-1195.

Methods and equipment for removing defects from ingots before forging or rolling. Graph, photographs, tables, diagrams. 3 ref. (F21, ST)

380-F. (German.) **Maintenance Cost of Soaking Pits.** Herbert Peters. *Stahl und Eisen,* v. 74, no. 19, Sept. 9, 1954, p. 1212-1215.

Repair costs, possible savings, soaking pit slags and performance of various types of brick. Diagrams, graphs, tables, photographs. 2 ref. (F21)

381-F. (Russian.) **Rapid Heating of Steel in Automatic Gas Furnaces.** V. F. Kopytov. *Vestnik Mashinostroeniia,* v. 34, no. 8, Aug. 1954, p. 50-51.

Furnace types and their advantages. Uses include heating and feeding blanks into presses. Diagrams, graph. 1 ref. (F21, ST)

382-F. Copper and Copper Alloys for Wire and Tube Manufacture. R. F. Neller. *Australasian Engineer,* 1954, Aug., p. 62-66; disc., p. 66-68.

Effects of composition on hot workability of copper and copper alloys. Tables. 13 ref. (F28, F26, Cu)

383-F. Sendzimir Planetary Hot Mill. John H. Mort. *Iron & Steel,* v. 27, Oct. 1954, p. 486-490.

Application of mathematical formulas for design and operation. Tables, graphs. (F23)

384-F. Fabrication Study Points to Increased Titanium Applications. W. P. Brotherton. *Steel Processing,* v. 40, Oct. 1954, p. 650 + 6 pages.

Forming, welding and riveting experience on commercially pure titanium. Photographs. (F general, G general, K general, T general, Ti)

385-F. Gas vs. Oil vs. Gas-Oil for Forging. R. J. Reed. *Steel Processing,* v. 40, Oct. 1954, p. 653-660.

Survey failed to show any case in which changes in fuel alone appreciably improved production rate, fuel efficiency or product quality. Photographs, tables, graphs. 7 ref. (F22)

386-F. The Effects of Coiling Temperature on Hot Rolled Rod. R. A. Stebbins. *Wire and Wire Products,* v. 29, Oct. 1954, p. 1141-1142, 1247.

Substantial savings were obtained by coiling C-1008 steel rod at 1450° F. instead of 1750 or 1950° F. Table, graphs. (F27, CN)

387-F. Cooling of Steel Wire During Continuous Drawing. Norman A. Wilson. *Wire and Wire Products,* v. 29, Oct. 1954, p. 1160-1163, 1166-1169, 1253.

Improved air-cooling facilities permit higher drawing speeds. Photograph, graphs, diagrams, table. 7 ref. (F28, CN)

388-F. Temper Mill Control. George P. Dirth. *Iron and Steel Engineer,* v. 31, Oct. 1954, p. 81-92; disc., p. 92-93.

Regulation of rolling mill speeds. Diagrams, circuits. 3 ref. (F23)

389-F. Processing and Drawing of Steel Wire. P. A. Beaman. *Iron and Steel Engineer,* v. 31, Oct. 1954, p. 96-100.

Processes and treatments for producing high-quality, high-strength wire. Photographs. (F28, CN)

390-F. (German.) **Calculation of Spreading and of Forward Slip in Rolling.** A. Geleji. *Acta Technica Academiae Scientiarum Hungaricae,* v. 9, nos. 3-4, 1954, p. 443-458.

Effect of variations in dimensions of the rolled piece. Graphs, diagrams, 9 ref. (F23)

391-F. (German.) **Comparison of Various Lubricant Carriers Used in Drawing Stainless Steel Wire.** Herbert Kuntze and Anton Pomp. *Stahl und Eisen,* v. 74, no. 21, Oct. 7, 1954, p. 1325-1334.

Comparison of cemented carbide die wear and friction values. Micrograph, diagram, tables, photographs, graphs. (F1, F28, C-n, SS)

392-F. (German.) **The Effect of Lubricants on the Drawing Load in Steel**

Bar Drawing. Werner Lueg and Karl-Heinz Treptow. *Stahl und Eisen*, v. 74, no. 21, Oct. 7, 1954, p. 1334-1342.

Comparison of physical and chemical characteristics of natural and synthetic lubricants. Influence of other variables on drawing load. Tables, micrographs, graphs, photographs. 12 ref. (F1, F27, ST)

393-F. (Book.) **Forming of Austenitic Chromium-Nickel Stainless Steels.** 2nd Ed. 394 p. 1954. International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y.

Mechanical properties, forming characteristics, processing after forming, details of various forming operations. (F general, G general, Q general, SS)

394-F. (Book-German.) **(The Rolling of High-Quality Steels.) Das Walzen von Edelstählen,** H. Sedlaczek. 246 p. 1954. Verlag Stahleisen, Düsseldorf, Germany. 26 D.M.

An examination of all stages of production from cogging to rod and strip rolling; plant layout, mill design, furnace construction; problems of roll pass design and heat treatment; treatment of different steels. (F23, ST)

SECTION G

SECONDARY MECHANICAL WORKING

1-G. Tape - Controlled Machines. Lawrence R. Peaslee. *Electrical Manufacturing,* v. 52, Nov. 1953, p. 102-108.

Any number of machine motions and on-off operations can be programmed through complete cycle from magnetic tape, using record-playback techniques and servo principles. Photographs, diagrams. 11 ref. (G17)

2-G. Machining Integrally Stiffened Structures. J. C. Borger. *Mechanical Engineering,* v. 75, Nov. 1953, p. 871-874

Problems encountered in process, and tremendous advantages of its use, especially as applied to aircraft industry. Diagrams, photographs. (G17)

3-G. Superfinishing Methods for Rotating Shafts. F. Spicer. *Product Finishing,* v. 6, Oct. 1953, p. 48-51.

Principle and advantages of superfinishing. (G19)

4-G. Stretch-Forming. *Aircraft Production,* v. 15, Nov. 1953, p. 440-442.

Equipment suitable for manipulation of section and narrow sheet. Photographs, diagrams, table. (G9)

5-G. Extruding Fastener Holes Simplifies Sheetmetal Assembly. Federico Strasser. *Iron Age,* v. 172, Nov. 19, 1953, p. 151-153.

Extrusion of bosses on sheet stock. Advantages of bosses over flat fastener holes. Diagrams. (G5, K13)

6-G. How Machinable Are the Cast Irons? E. A. Loria. *Iron Age,* v. 172, Nov. 19, 1953, p. 158-161.

Guide to the selection and machining of nodular, malleable and gray cast irons. Table. (G17, CI)

7-G. Feeding Short Strip Stock to Be Formed, Extruded, and Embossed Through a Progressive Die. Paul Prikos. *Machine and Tool Blue Book,* v. 49, Nov. 1953, p. 157-160.

Incorporation of certain designs in the die to obtain smooth operation. Describes dies with automatic coil feed stock arrangements. Diagrams. (G3)

8-G. Plastic Dies Speed Delivery of Experimental Stampings. W. Curtis Miller and W. J. Esdale. *Machinery,* v. 60, Nov. 1953, p. 172-177.

Preparation of dies for production of automobile bodies. Materials, molds, patterns and fitting. Photographs, diagram. (G3)

9-G. Piston Production at Ford Features Automation and Quality Control. Edgar Altholz. *Machinery,* v. 60, Nov. 1953, p. 196-201.

Machining, tin plating, and grading. Photographs. (G17, L17, S12, A5)

10-G. How to Make Plastic Draw Dies in 9 Steps. G. C. Adams. *SAE Journal,* v. 61, Nov. 1953, p. 21-25.

Detailed description of making dies and tooling for production of automobile bodies. Diagrams. (G4, T5)

11-G. The Forming of Aluminium Sheet. II. Bending. H. Hinxman. *Sheet Metal Industries,* v. 30, no. 319, Nov. 1953, p. 943-948, 952.

Tooling and procedures for folding, flanging, curling, grooving, beading and seaming. (To be continued.) (G6, Al)

12-G. Stretcher-Strain Markings in Aluminium Alloys and Methods for Their Elimination. V. A. Phillips. *Sheet Metal Industries,* v. 30, no. 319, Nov. 1953, p. 977-985.

Effects of composition, grain size, heat treatment and working. Graphs, tables. (To be continued.) (G4, Al)

13-G. Pre-Spinning Increases Drop Hammer Production. *Western Ma-*

chinery and Steel World, v. 44, Nov. 1953, p. 105-108.
Adapting spinning, as a pre-forming tool, in stage drop hammer operations has reduced costs and increased production. Photographs. (G13, F22)

14-G. (German.) **The Kinetics of Grinding Processes.** Gustav F. Hüttig. *Zeitschrift für Elektrochemie,* v. 57, no. 7, 1953, p. 534-539; disc., p. 539.
Grinding functions and their applications on coarse and fine grinding processes. Problem of similarity between physical and chemical processes. Graphs, tables. 6 ref. (G18)

15-G. Rubber Pad Forming. *Modern Industrial Press,* v. 15, Nov. 1953, p. 22, 26, 28, 32, 34, 38.
Presses and tooling. Photographs. (G8)

16-G. Electro-Spark Erosion for Metal Machining and Cutting. D. W. Rudorff. *Welding and Metal Fabrication,* v. 21, Nov. 1953, p. 425-429.
Basic principles underlying new method; its advantages. Most important applications lie in field of cemented carbides and highly alloyed heat resistant alloys. Diagrams, photographs. 3 ref. (G17)

17-G. (Book.) **Pipe and Tube Bending.** Paul B. Schubert. 183 p. 1953. Industrial Press, 148 Lafayette St., New York 13, N. Y. $5.00.
Common methods and operating characteristics of equipment used in bending ferrous and nonferrous pipe and tubing. (G6)

18-G. Die Life Is up 18 Times With Ductile-Iron Dies. J. C. Neemes, Jr. *American Machinist,* v. 97, Dec. 7, 1953, p. 134-135.
Composition, applications and advantages of ductile iron dies for operations on brass cartridge cases. (G1, T5, CI, Cu)

19-G. An Evaluation of Spinning vs. Drawing Relates the Methods. J. Lengbridge. *Canadian Metals,* v. 16, Nov. 1953, p. 36, 38, 40.
An evaluation of spinning and drawing shows they can compete as well as supplement each other according to the economics involved in individual cases. Diagrams. (G13, G4)

20-G. Using Tungsten Carbide Tools. *Edgar Allen News,* v. 32, Nov. 1953, p. 241-243.
Shapes, grades, selection and methods of brazing carbide tools. Diagrams. (To be concluded.) (G17, K8)

21-G. Pressure. Versatile Equipment Broadens Work Range. John E. Hyler. *Iron Age,* v. 172, Dec. 3, 1953, p. 168-171.
Hydraulic presses which handle a wide variety of assembly jobs by fitting, crimping, riveting, staking and other pressure methods. Photographs. (G1)

22-G. Improved Chuck Speeds Machining of Brass Parts. Dale Stoneman. *Iron Age,* v. 172, Dec. 3, 1953, p. 177-179.
Reductions in machine-handling and work-handling times through use of an improved chucking device have substantially reduced over-all time per piece in machining brass pipe fittings. Photographs. (G17, Cu)

23-G. The Critical Rake Angle Method of Evaluating Cutting Fluids. W. E. Lauterbach and E. A. Ratzel. *Lubrication Engineering,* v. 9, Dec. 1953, p. 313-315.
Results of experimental studies conducted to show applications and limitations of this method. Tables, graph, photographs. (G21)

24-G. Producing Tubing Assemblies for Airplane Engines. *Machinery,* v. 60, Dec. 1953, p. 175-179.
Fabricating assemblies of seamless steel tubing and forged fittings for oil, fuel and exhaust lines. Bending, machining and welding operations. Photographs. (G6, G17, K general)

25-G. When and How to Use Carbides in Machining Stainless Steel. G. J. Stevens. *Machinery,* v. 60, Dec. 1953, p. 196-200.
Includes diagrams. (G17)

26-G. Making Hollow Steel Propeller Blades. Methods Employed at the Hatfield Factory of de Havilland Propellers, Ltd. *Machinery (London),* v. 83, Nov. 13, 1953, p. 939-947.
Forming operations. Photographs. (G general, AY)

27-G. Machining—Theory and Practice. K. G. Lewis and W. Milne. *Machinery (London),* v. 83, Nov. 20, 1953, p. 1007-1013.
Machinability, tool life, types of tool failure and work handling. Graphs, tables. 24 ref. (G17)

28-G. Finish Rolling Cast Iron Guiding Surfaces for Machine Tools. W. Iwascheff. *Machinery (London),* v. 83, Nov. 27, 1953, p. 1058-1060.
Technique, applications and advantages of finishing previously machined cast iron guideways or bearing surfaces by pressure rolling. Photographs, graphs, table. (G19, CI)

29-G. The Corrosive Properties of Soluble Cutting Oils. Effect on Machine Tool Cast Irons. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 233-240.
Studies on the influence of cutting

oils on efficiency of machining operations. Photographs, tables, graphs. (G21, G17, R7)

30-G. The Problem of Dry Friction in Chip Forming Machining. E. Bickel. *Microtecnic (English Ed.),* v. 7, no. 5, 1953, p. 243-245.
Causes of wear including plastic deformation, brittle fracture and wear produced by chip sliding along face of cutting edge. 9 ref. (G17, Q9)

31-G. Hydro-Press High-Pressure Cylinder Development. Don R. Maynard. *Modern Machine Shop,* v. 26, Dec. 1953, p. 152-154, 156, 158, 160.
Cylindrical containers for high-pressure rubber forming tools. Photographs, diagrams. (G8)

32-G. Hot Forming Titanium. *Modern Metals,* v. 9, Nov. 1953, p. 88, 90.
Methods of press forming titanium sheet. Photographs. (G1, Ti)

33-G. What About Your Safety Program? Harry Chandler. *Steel,* v. 133, Nov. 30, 1953, p. 101-104.
Safety equipment and procedures in a stamping plant. Photographs. (G3, A7)

34-G. How to Get the Most From Carbide Tools. Edward J. Novack. *Tool Engineer,* v. 31, Dec. 1953, p. 37-43.
Selection, design, performance, maintenance and inspection of tools. Diagrams, photographs. (G17)

35-G. Finish Rolling Improves Cast Iron Ways. Wackch Iwascheff. *Tool Engineer,* v. 31, Dec. 1953, p. 57-59.
Tools and procedures for cold rolling cast iron machine tool ways. Diagram, micrograph, table. (G11)

36-G. Magnesium Forming. II. Hot Drop Hammer Forming and Sheet Stretching. Francis L. Coenen. *Tool Engineer,* v. 31, Dec. 1953, p. 62-68.
Die design and operating procedures. Diagram, photographs, table. (G9, F22, Mg)

37-G. Machining Stainless Steels. *Tool Engineer,* v. 31, Dec. 1953, p. 81-84.
Tools and machining speeds for the less machinable grades. Tables. (G17, SS)

38-G. (French.) **Mechanism of the Formation of the Arrest Reported During the Cutting of Metals.** Paul Bastien and Michel Weisz. *Comptes rendus,* v. 237, no. 16, Oct. 19, 1953, p. 871-873.
Investigation of low-alloy steel. Causes for phenomenon indicated and interpreted. Graph, micrograph. 2 ref. (G17, AY)

39-G. (French.) **Conditions of Stability of the Built-Up Edge in Phenomena of Metal Cutting.** Paul Bastien and Michel Weisz. *Comptes rendus,* v. 237, no. 17, Oct. 28, 1953, p. 968-970.
Stability as a function of cutting temperature and resulting effect on surface finish. Graphs, micrographs. (G17)

40-G. (French.) **Machinability of Stainless Steel.** Jean Daurat. *Métallurgie et la construction mecanique,* v. 85, no. 11, Nov. 1953, p. 885, 887.
Lubrication during machining. Types of lubricating oils, temperature of cooling oils, cleaning of pieces, cleanliness of the lubricant and importance of spraying apparatus. Diagrams. (G17, G21, SS)

41-G. (Russian.) **Theoretical Equation of the Cutting Force.** A. M. Rozenberg and A. N. Eremin. *Vestnik Mashinostroeniia,* v. 33, no. 8, Aug. 1953, p. 55-59.
Experimental testing carried out on several steels. Graphs. 6 ref. (G17, ST)

42-G. (Russian.) **Reproducibility and Productivity of Electrospark Machining.** S. A. Kipnis. *Vestnik Mashinostroeniia,* v. 33, no. 8, Aug. 1953, p. 59-66.
Theoretical study of relationship of wear in the instrument and corresponding wear of the processed part. Tables, diagrams. 7 ref. (G17, Q9)

43-G. Bending Structural Sections. K. Gunn and D. F. Michell. *Aircraft Production,* v. 15, Dec. 1953, p. 444-450.
Review of techniques for forming high-strength aluminum alloys. Photographs, graphs. 4 ref. (G6, Al)

44-G. Thread-Rolling. New Attachment for Use on Standard Production-Type Machines. *Aircraft Production,* v. 15, Dec. 1953, p. 482.
Rollrite self-opening thread-rolling die-head, designed for use on machines such as capstan and turret-lathes and drilling-machines. Photograph. (G12)

45-G. Pass Design and Rolling of Automotive Rim Sections. Howard H. Morgan. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 55-60; disc., p. 60, 61.
Techniques and equipment employed in continuous rolling of intricate shapes requiring exacting tolerances. Diagrams, table. (G11)

46-G. (Russian.) **Influence of Water and Alcohol on the Grinding of Metals.** V. D. Kuznetsov and V. D. Taranenko. *Doklady Akademii Nauk SSSR,* v. 92, no. 1, Sept. 1, 1953, p. 49-52.

Results of experiments with abrasive grinding of aluminum, copper and zinc in air, water and ethyl alcohol do not agree with results of other investigations. Tables, diagram. 2 ref. (G18, Al, Cu, Zn)

47-G. **Cut Finishing Time 2/3 on 120-MM. Powder Chambers.** Anderson Ashburn. *American Machinist,* v. 97, Dec. 21, 1953, p. 100-101.

Tracer-controlled grinders have been taking over internal finishing of gun-tube powder chambers a size at a time. Photographs, diagrams. (G18, ST)

48-G. **Improved Techniques Developed for Grinding Titanium Carbides.** F. J. Lennon, Jr. *Iron Age,* v. 172, Dec. 17, 1953, p. 144-146.

Diamond wheels are recommended, but the more economical silicon carbide wheels may be used if wheel speeds are kept in the low 3500 to 4000 range of surface ft. per min. Photographs. (G18, Ti)

49-G. **Improving the Fatigue Life of Springs by Liquid Honing.** H. J. Steel. *Machinery (London),* v. 83, Dec. 4, 1953, p. 1083-1093.

Process of liquid honing, techniques of testing fatigue life and variables to be considered in treatment of springs. Photographs, micrographs, diagrams, tables, graphs. (G19)

50-G. **Electro-Mechanical Methods for Machining and Grinding Cemented Carbides.** *Machinery (London),* v. 83, Dec. 11, 1953, p. 1146-1148.

Equipment, techniques and advantages of process. Experimental studies to determine rate of grinding and wheel wear. Table. (G17, G18)

51-G. **O.B.I. Press—An Ideal General Purpose Machine.** Ernest C. Morse. *Modern Industrial Press,* v. 15, Dec. 1953, p. 22, 24, 26, 30, 32, 34.

Line of presses. Photographs. (G1)

52-G. **"Design Leadership" Slogan at Seattle Plant of Square D Company.** Howard E. Jackson. *Modern Industrial Press,* v. 15, Dec. 1953, p. 36, 38, 40, 42, 44, 46, 48, 68.

Facilities for fabrication of sheet metal products. Photographs. (G general, CN)

53-G. **Selecting a Mechanical or Hydraulic Press for Your Particular Job.** Len Crary. *Modern Industrial Press* v. 15, Dec. 1953, p. 50, 52, 54, 58, 60, 62, 64.

Working stroke and various draw problems, selecting the proper press in each case. Diagrams, table. (G1)

54-G. **Pressure Vessel Fabrication in New Plant.** Kenneth L. Walker. *Modern Machine Shop,* v. 26, Jan. 1954, p. 136-144, 146.

Giant size tools for forming, machining, welding and testing huge processing equipment. Photographs. (G general, K general, S general)

55-G. **Relation of [Abrasive] Wear to the Grinding Area.** G. D. Polosatkin. *National Science Foundation Translation,* no. 42, Aug. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 971.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

A continuation and extension of previous investigations of relation between abrasive wear and metal cutting. Graphs. 1 ref. (G18, Q9)

56-G. **Metal Spinning, Its Implications, and Applications.** Lester F. Spencer. *Steel Processing,* v. 39, Dec. 1953, p. 631-640.

Process, equipment requirements, materials, lubrication, techniques and other basic considerations. Photographs, graphs, diagrams, tables. 9 ref. (G13)

57-G. **Finishing Intricate Castings.** Russell H. Bennett. *Western Machinery and Steel World,* v. 44, Dec. 1953, p. 87-88.

Engineering has played a big factor in design of fixtures for machining of intricate aluminum castings at Hoover Electric Co. Photographs. (G17, Al)

58-G. **Tooling Applications.** *Western Machinery and Steel World,* v. 44, Dec. 1953, p. 108-109.

Cost-cutting applications of tungsten carbide milling cutters. Photographs, diagrams. (G17, W)

59-G. **Titanium & Stainless Offer Knotty Problems in Abrasive Grinding.** Fred A. Upper. *Western Metals,* v. 11, Dec. 1953, p. 68-69.

Grinding wheels, coolants and other factors. (G18, G21, Ti, SS)

60-G. **Rod and Wire Quality vs. Cold Heading Quality.** William E. Hill, Jr. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1291-1293, 1357-1359.

Improper uses to which cold heading rods and wire may be put that can result in unsatisfactory products. Photographs. (G10)

61-G. **Machinability and Microstructure.** Hans J. Heine. *American Foundryman,* v. 25, Jan. 1954, p. 58-61.

Effect of microstructure on machinability, strength and hardness of a material. Micrographs, tables. (G17, M27)

62-G. **Caterpillar Hollow - Grinds Clamped Carbide Tips.** Matt Aljanich. *American Machinist,* v. 98, Jan. 4, 1954, p. 89-91.

Equipment and techniques employed. Photographs, diagrams, table. (G18)

63-G. Versatile Producer. The Press Brake. II. Piercing and Notching Units Permit Progressive Setups. J. M. Matthewman. *American Machinist,* v. 98, Jan. 4, 1954, p. 96-99.
Equipment and techniques employed. Photographs. (G2)

64-G. Wide-Flanged Shells Draw Easily if You Follow the Rules. Stanley R. Cope. *American Machinist,* v. 98, Jan. 4, 1954, p. 100-103.
Die design and deep drawing operations for production of wide flange shells. Diagrams. (G4)

65-G. High-Speed Trepanning. William M. Stocker, Jr. *American Machinist,* v. 98, Jan. 4, 1954, p. 105-114.
Equipment, techniques and factors to be considered in hole boring. (G17)

66-G. Deep-Hole Boring. H. J. Pearson. *Automobile Engineer,* v. 43, Dec. 1953, p. 563-570.
Development of a new production process for high-speed boring. Current German and Swedish practice. Photographs, diagrams. (G17)

67-G. Using Tungsten Carbide Tools. *Edgar Allen News,* v. 32, Dec. 1953, p. 271-272.
General recommendations for use of tools. Diagrams, tables. (G general)

68-G. The Grinding of Steel. XIII. Grinding Broaches, Scrapers, Chasers and Other Tools. *Edgar Allen News,* v. 32, Dec. 1953, p. 277-278.
Stages in grinding tangential chasers. Table, graph, diagrams. (To be continued.) (G18)

69-G. Proper Tooling Simplifies Machining of Jet Parts. Dennis G. Jones. *Iron Age,* v. 172, Dec. 31, 1953, p. 76-79.
Wide use of high temperature, stainless and titanium alloys for jet engine parts has raised new demands for improved tooling. Photographs, tables. (G17, SS, Ti)

70-G. Deep Drawing Titanium Cups. Carter C. Higgins. *Light Metal Age,* v. 11, Dec. 1953, p. 10-11.
Research into titanium is opening up new possibilities for fabricators. Photographs. (G4, Ti)

71-G. Making Hollow Steel Propeller Blades. *Machinery (London),* v. 83, Dec. 18, 1953, p. 1187-1193.
Machining operations on the root interrelated with matching and balancing of blades. Photographs. (G17)

72-G. Machining Operations on Parts for Small Gas Turbines. *Machinery (London),* v. 83, Dec. 18, 1953, p. 1194-1196.
Boeing Airplane Co. compacts 175-hp. gas turbine and manufacturing techniques. Photographs. (G17)

73-G. The CeDeCut Carbon Dioxide Cooling Technique. *Machinery (London),* v. 83, Dec. 25, 1953, p. 1239-1243, 1285.
Use of liquefied gas as a coolant in metalcutting processes. Photographs. (G21)

74-G. Form-Grinding of Worm Threads. W. A. Tuplin. *Machinery (London),* v. 83, Dec. 25, 1953, p. 1257-1261.
Use of involute helicoid form for worm threads and grinding methods by flat-faced abrasive wheels. Diagrams, photograph. (G18)

75-G. Machining Large Crankshafts. *Mechanical World and Engineering Record,* v. 133, Dec. 1953, p. 544-546.
Equipment, plant layout and operating procedures. Photographs. (G17)

76-G. Production of Gas Turbine Blades. B. P. Dabell and L. H. Williams. *Metal Treatment and Drop Forging,* v. 20, Dec. 1953, p. 571-578.
Various manufacturing techniques and advantages of precision casting and forging of blades. Photographs, tables. (G general, E15, F22)

77-G. Metallurgists Offer Cutting Tools a Bigger Bite. Robert F. Huber. *Steel,* v. 134, Jan. 11, 1954, p. 70-73.
Alloying elements improve machinability of basic steels but leave other physicals unchanged. Photographs, tables. (G17, ST)

78-G. Get the Most Out of Cold Heading. H. C. Weidner, Jr. *Steel,* v. 134, Jan. 11, 1954, p. 74-75.
Operation is generally thought of as being synonymous with fasteners, but equipment, tool and material improvements offer new engineering possibilities. Photographs, diagrams. (G10)

79-G. Magnesium Forming. III. In the Brake and Hydropress. Francis L. Coenen. *Tool Engineer,* v. 32, Jan. 1954, p. 65-72.
Factors which must be given special consideration in working with magnesium, including minimum bend radii, forming temperature and time at temperature. Photographs, graphs, diagrams. (G1, G8, Mg)

80-G. (German.) **Problems of Shaping Sheet Metals.** E. Siebel. *Metall,* v. 7, nos. 23-24, Dec. 1953, p. 970-973.
Cupping, deep drawing, expanding, and spinning methods. Diagrams, 7 ref. (G4, G13, G14)

81-G. (Russian.) **Abrasive Processing of Castings.** M. I. Borisov, E. G. Rutter and I. I. Sankov. *Liteinoe*

Proizvodstvo, 1953, no. 8, Aug., p. 12-15.

Operation of semi-automatic machine. Diagrams, tables. (G18)

82-G. (Russian.) **Machining of Porous Chromium Parts.** N. A. Kamenev, A. A. Mikhailov and M. A. Shluger. *Stanki i Instrument,* v. 24, no. 10, Oct. 1953, p. 28-29.

Methods of maintaining geometrical form and means of preventing closing of pores. Graphs. 3 ref. (G17, Cr)

83-G. Pull-Boring. *Aircraft Production,* v. 16, Jan. 1954, p. 6-8.

Developments in draw-cut machining for second-operation boring. Photographs, diagrams, table. (G17)

84-G. Distribution of Shear-Zone Heat in Metal Cutting. W. C. Leone. *ASME, Transactions,* v. 76, Jan. 1954, p. 121-124; disc., p. 124-125.

Presents an expression for the fraction of thermal energy developed at the shear zone in orthogonal metal cutting which is conducted back into workpiece. Diagrams, graph, tables. 15 ref. (G17)

85-G. Electrodes Displace Twist Drills. H. V. Harding. *Aviation Age,* v. 21, Jan. 1954, p. 98-99.

Holes spaced 0.005 in. apart can be drilled in any metal without distortion of holes or mutilation of web between holes. Photograph. (G17)

86-G. Machining by Electro-Erosion. Leo Walter. *Canadian Metals,* v. 17, Jan. 1954, p. 45-46, 48.

Electro-erosion processes for shaping of metals have been known for some time, but electromechanical repetitive sparking technique has recently progressed considerably. Photographs. (G17)

87-G. A New Plant—Mountaintop, Pa. *Heat Engineering,* v. 28, Oct.-Dec. 1953, p. 97-103.

New, modern plant for fabrication of steam drums and pressure vessels for use in power, petroleum, and process industries. Photographs. (G general)

88-G. Machining the Aviation Gas Turbine High-Temperature Alloys. D. C. Goldberg and H. O. J. Hanzlick. *Machine and Tool Blue Book,* v. 49, Jan. 1954, p. 206-211, 214-218, 220-223.

Metallurgical requirements for compressor, combustion chamber, turbine, and afterburner as well as tooling required to fabricate parts. Tables, photographs. (G17, SG-h)

89-G. Tracer Controls for Machine Tools. George L. Rogers and John L. Dutcher. *Machine Design,* v. 26, Jan. 1954, p. 236, 238, 240-242, 244.

Taken from paper entitled "Practical Considerations in the Use of Tracer Controls" presented at Sixth Annual AIEE Conference on Machine Tools in Cleveland, O., Oct. 1953. Types of tracer systems and their limitations. (G17)

90-G. Magnetic Tape Programming of Machine Tools. Lawrence R. Peaslee. *Machinery,* v. 60, Jan. 1954, p. 166-172.

How the tape passing through the recorder sets up, or "programs", the signals necessary to control all moving members of a machine tool throughout its operating cycle. Photographs, diagrams. (G17)

91-G. Surface Tempering Caused by Grinding. Gordon Murphy. *Machinery,* v. 60, Jan. 1954, p. 202-203.

Taken from paper presented before Fall Meeting of American Gear Manufacturers Association. Solving surface temper problem ended grinding cracks through elimination of instantaneous heating which was accompanied by rapid expansion and contraction. (G18, ST)

92-G. Developments in Aircraft Production Methods. S. P. Woodley. *Machinery (London),* v. 84, Jan. 8, 1954, p. 88-94.

Based on paper presented at conference of Southern Section of the Institution of Production Engineers, Southampton. Replacement of sheet metal assemblies by single components machined "from the solid" has modified production trends. Photographs, drawings. (G17)

93-G. Production of Large Aircraft Panels From Sheet Material. R. B. Scott and R. L. Vaughan. *Machinery (London),* v. 84, Jan. 15, 1954, p. 121-125.

Fabrication of many airframe parts, simplified by use of an 8000-ton Birdsboro hydraulic triple-action press, which has been installed by the Lockheed Aircraft Corp., Burbank, Calif. Photographs, diagram. (G4)

94-G. Bending Thin-Wall Tubing. F. Pesak. *Machinery (London),* v. 84, Jan. 15, 1954, p. 129-133.

Need for saving weight and space in current and prototype aircraft designs often introduces problems which cannot be solved by established fabricating techniques. Relates to bending of thin-wall tubing for high-pressure ducts of heating and ventilating systems. Diagrams, photographs. (G6, Al)

95-G. Machinability of Heat-Treated Steel. Robert C. Gibbons. *Materials & Methods,* v. 39, Jan. 1954, p. 86-88.

Selection of proper steel, choosing

correct heat treatment, and using suitable machining conditions. Photographs. graph.
(G17, J general, ST)

96-G. Developing a Test for Broaching Titanium and Its Alloys. R. E. McKee and W. W. Gilbert. *Mechanical Engineering,* v. 76, Jan. 1954, p. 6-12.
Test procedure and criteria for measuring effect of broaching on tool life. Graphs, photographs, tables. 1 ref. (G17, Ti)

97-G. Thread Rolling. *Mechanical World and Engineering Record,* v. 134, Jan. 1954, p. 23.
Characteristics of a method giving a high rate of production with accurate thread form and a stronger metal structure. Diagram. (G12)

98-G. Converting Polishing Lathes to Use Coated Abrasive Belts. J. J. Durnan. *Metal Finishing,* v. 52, Jan. 1954, p. 62-63, 69.
Procedure for conversion which will insure good belt tracking, and a practical range of machine flexibility on existing equipment. Diagrams, photograph. (G19)

99-G. Selecting a Mechanical or Hydraulic Press for Your Particular Job. Len Crary. *Modern Industrial Press,* v. 16, Jan. 1954, p. 56, 58, 60, 62-63.
Twin-drive, toggle presses, drawing speeds, and redrawing operations. Examples of hemispherical and conical shells. Tables, diagrams. (G1)

100-G. Increased Productivity With Carbides. I. Selection and Application. Guy Monacelli. *Screw Machine Engineering,* v. 15, Jan. 1954, p. 33-37.
Factors to be considered in machining metals and nonmetals. Photographs, tables, diagrams. (G17)

101-G. Bar Stock and Stocking Efficiency. *Screw Machine Engineering,* v. 15, Jan. 1954, p. 51-53.
Minute savings in machine time, stock, and downtime represent staggering savings when the run is exceptionally long. Table, diagrams, photographs. (G17)

102-G. Data Sheet 3-A. Speeds and Feeds for Aluminum. *Screw Machine Engineering,* v. 15, Jan. 1954, p. 55-58.
Forming, necking, facing, skiving, turning, box milling, and cutting-off. Tables. (G17, Al)

103-G. The Forming of Aluminium Sheet. III. Spinning. H. Hinxman. *Sheet Metal Industries,* v. 31, no. 321, Jan. 1954, p. 41-45, 50.
Properties and technique. Photographs. (To be continued.)
(G13, Al)

104-G. Research Views Machinability. How to Determine Machinability. Francis W. Boulger. *Steel,* v. 134, Jan. 18, 1954, p. 88-90.
Inherent ability of workpiece material to aid cutting tool is part of rapid machining picture. Effect of environmental factors. Graphs, tables, photograph, diagram. (G17)

105-G. Steel Cartridge Cases. Their Cold Forming and Heat Treating. S. S. Rice. *Tooling and Production,* v. 19, Dec. 1953, p. 52-58.
Includes photographs, diagrams, micrographs. (G4, J general, CN)

106-G. Machines. *Draht (English Ed.),* 1953, no. 17, Dec., p. 33-35.
Automatic wire winding machine, high production machine for manufacture of link and roller-chain brushes and rollers, and automatic nut milling machine. Photographs, table. (G general)

107-G. A New Process for the Manufacture of Cold Formed Hexagon Nuts. F. Lie Kmeier. *Draht (English Ed.),* 1953, no. 17, Dec., p. 43-44.
Equipment and operating techniques. Photographs. (G10)

108-G. (Russian.) **Analysis of Factors Affecting Contact Area of a Shaving With the Face of the Tool and Average Normal Specific Pressure.** A. M. Zhukov. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 52-56.
Change of tool strength under various cutting conditions. Macrographs, graphs, tables. 4 ref. (G17)

109-G. Belt Finishing of Carbide Tools Proves Effective. F. J. Lennon, Jr. *American Machinist,* v. 98, Feb. 1, 1954. p. 104-107.
Special abrasive-belt grinders are a suitable alternate to diamond wheels in times of emergency. Photomicrographs, photographs, diagram. (G18)

110-G. The Grinding of Steel. XIII. Grinding Broaches, Scrapers, Chasers, and Other Tools. XIV. Grinding Steel Castings. *Edgar Allen News,* v. 33, Jan. 1954, p. 11-12.
Grinding taps, wheel speeds and type, machine maintenance and precautions in grinding. Photograph, tables. (To be continued.) (G18, ST)

111-G. Vibrator Control of Tracer Drive. S. H. Rover. *Electrical Manufacturing,* v. 53, Feb. 1954, p. 101-105.
Low-contact pressures between stylus and template is achieved with new automatic tracer for flame-cutting machines. Photographs, diagrams. (G22)

112-G. How Does Titanium Machine? I. O. W. Boston. *Iron Age,* v. 173, Jan. 21, 1954, p. 100-103; Jan. 28, 1954, p. 120-122.

Research on chip formation, work hardening, surface finish, tolerances, cutting temperatures and nature of tool wear. Photograph, micrographs, graphs, table. (G17, Ti)

113-G. Machining Innovations Expedite Work on Zinc Die Castings. Herbert Chase. *Machine and Tool Blue Book,* v. 49, Feb. 1954, p. 197-198, 200-201.

Broaching slot in window regulator handle hub proves faster than side coring. Diagram, photographs. (G17, Zn)

114-G. Improved Honing. *Machinery Lloyd (Overseas Ed.),* v. 26, Jan. 16, 1954, p. 95-96.

Machine and operating characteristics. Diagram. (G19)

115-G. Spinning Non-Circular Components for Aircraft. J. S. Walker. *Machinery (London),* v. 84, Jan. 22, 1954, p. 186-188.

Equipment, techniques and applications. Photographs, diagram. (G13)

116-G. How to Machine Aluminum and Magnesium. Guy Monacelli. *Modern Metals,* v. 9, Jan. 1954, p. 33-34, 36, 38.

Achievement of best results when machining aluminum and magnesium with tools made of "Carboloy" cemented carbides. Tables, photographs. (G17, Al, Mg)

117-G. Magnesium Forming. IV. Deep Drawing and Miscellaneous Methods. Francis L. Coenen. *Tool Engineer,* v. 32, Feb. 1954, p. 68-71.

Effects of temperature, rate of loading and lubrication. Diagram, graph, photographs. (G4, Mg)

118-G. Stretch Forming. A Specialty. *Western Machinery and Steel World,* v. 45, Jan. 1954, p. 99-101.

Discussion of underlying principles. Photographs. (G9, Al)

119-G. (Photocopy.) **The Grinding of Titanium Alloys. P. B. 112049. MIT for U. S. Army Ordnance Corps.** 76 p. 1953. Available from Library of Congress, Washington 25, D. C. Microfilm $3.50. Photostat $10.00.

Grinding characteristics of four representative titanium alloys are reported in this study. Rate of wheel wear, surface finish, energy consumed, and metallurgical damage are recorded for a wide range of variables. (G19, Ti)

120-G. (Book.) **Fabricated Materials and Parts.** T. C. Du Mond. 332 p. Chapman and Hall Ltd., 37, Essex St., London W.C. 2, England. 52s.

Survey of methods of manufacture available to designer. (G general)

121-G. (Book.) **Machine Shop Tooling Data for Machine Tool Operators and Machinists.** Charles C. Williams. 342 p. 1953. Wilco Press, 3326 N. Bailey St., Philadelphia 29, Penna.

Designed for the man at the machine and alphabetized like a dictionary for quick reference. Specific recommendations for drills, taps, milling cutters, grinding wheels, threaders, turning tools, special threads, etc., for all materials aluminum to zinc. Reference section on causes of most machine tool and material troubles and what to do about them. (G17)

122-G. Forming Magnesium-Alloy. *Aircraft Production,* v. 16, Feb. 1954, p. 52.

Method for continuously heating work and dies during processing. Diagram. (G general, Mg)

123-G. Electro-Erosion Machining. *Aircraft Production,* v. 16, Feb. 1954, p. 70-71.

Design and operating characteristics of new machine for automatic operation. Photographs, micrographs. (G17)

124-G. Cool Tip, Not Chip, With CO_2. *American Machinist,* v. 98, Feb. 15, 1954, p. 130-133.

New English technique applies coolant through lathe-tool shank, with reservoir under carbide tip and orifices aimed at work, not chips. The result is doubled or tripled cutting speeds. Photographs, diagram. (G21)

125-G. Low-Melting Alloys Provide Low-Cost Method to Spin Re-Entrant Shapes. Denver Sams and Joseph Borodavchuk. *American Machinist,* v. 98, Feb. 15, 1954, p. 145-147.

When limited quantity limits chuck cost, cast alloy can be machined to shape parts that will not slip off the chuck. The spun shell can be removed when completed by melting the chuck. Diagrams, photographs. (G13)

126-G. Cope Talks on Draw Dies. IX. Know the Wrinkles About Spherical Shells. Stanley R. Cope. *American Machinist,* v. 98, Feb. 15, 1954, p. 148-152.

Knowledge of rules and suitable die design should eliminate drawing troubles. Diagrams. (G4)

127-G. Why Line Your Sludge Tank With Diamonds? N. W. Thibault and B. H. Anderson. *American Machinist,* v. 98, Feb. 15, 1954, p. 154-156.

Electrolytically-assisted diamond-wheel grinding continues to show promise as a commercial method for sharpening single-point carbide tools without sacrificing tool performance. Photographs, tables. (G18, TS)

128-G. An Evaluation of Spinning vs. Drawing. John W. Lengbridge.

American Society of Tool Engineers, Technical Papers and Panel Discussion, v. 21, 1953, 17 p.

Time and cost criteria and dimensional accuracy requirement are among considerations. Tables, graph, photographs, drawings. (G13, G4)

129-G. Developments in Electrolytic Grinding. L. H. Metzger. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 10 p.

Brief essentials of the process with over-all picture of its merits and applications. Drawing, photographs. (G18)

130-G. Some Basic Relations in Contour Forming. George Sachs. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 6 p.

Limitations of bending-type contour forming. Drawings, graphs. (G1, Al)

131-G. Structure as an Index to Machinability. Norman Zlatin and John F. Kahles. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 10 p.

Considerable savings in machining costs are available to those who give some thought to the microstructure of the metals they are machining. Table, micrographs, graphs. (G17, ST, CI, Ni)

132-G. Tool Engineering Applications of Titanium Carbide Alloys. W. L. Kennicott. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 7 p.

These compositions were developed primarily for their heat resistant properties of high strength, thermal shock and oxidation resistance at temperatures of 1600° F. and above. Photographs, drawings, graph, table. (G17, Q general, Ti, C-n)

133-G. Wax Lubricants in Metal Working. James B. Carse, A. E. Budner and George L. Boehm. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 19 p.

Properties defined. Classifications and typical examples. Tables. (G21)

134-G. How Does Titanium Machine? III. O. W. Boston. *Iron Age,* v. 173, Feb. 4, 1954, p. 146-149.

Data on drilling and reaming. Graphs, table, photograph. (G17, Ti)

135-G. Get More From Your Surface Plates. John Hyler. *Iron Age,* v. 173, Feb. 4, 1954, p. 156-158.

Ideas on how to get the most from investment in metal and granite surface plates. Photographs. (G17)

136-G. A Tool-Blade Wear Test for Cutting Fluids. L. C. Hays and E. J. R. Hudec. *Lubrication Engineering,* v. 10, Feb. 1954, p. 20-23.

Method of evaluating cutting fluids on a lathe involving measuring wear of blunt tool blade which is rubbed against freshly cut surface under applied load. Tables, diagram, graphs. 3 ref. (G21)

137-G. Lubricants Aid Abrasive-Belt Grinding and Polishing. Jack Durnan. *Machinery,* v. 60, Feb. 1954, p. 173-176.

Factors affecting selection of lubricant and advantages of each. Photographs. (G21, G18)

138-G. The Influence of Machining and Grinding Methods on the Mechanical and Physical Condition of Metal Surfaces. Peter Spear, Ian R. Robinson and K. J. B. Wolfe. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. p. 59-100.

Problems associated with physics and chemistry of metal surfaces. Spectrographs, tables, micrographs, graphs, photographs. 12 ref. (G17, G18, P general, Q general)

139-G. (French—German.) **Physical and Technological Principles of Oxygen Cutting.** C. G. Keel. *Zeitschrift für Schweisstechnik,* v. 44, no. 1, Jan. 1954, p. 1-5.

Cutting of various metals and properties of oxides formed. Diagrams, graphs, table. (To be continued.) (G22)

140-G. (German.) **Powder-Dressing Process.** E. Zorn. *Metalloberfläche,* Ausgabe A, v. 8, no. 1, Jan. 1954, p. 8-9.

Iron powder flame process of dressing unalloyed or low-alloyed steel castings. Photographs, micrograph. (G22, CI)

141-G. (German.) **Designing to Meet Requirements of Flame Cutting.** Hans von Hofe. *Schweissen und Schneiden,* v. 5, no. 12, Dec. 1953, p. 463-472.

Methods, equipment, quality and accuracy of cut, guides and warp condition. Tables, graphs, photographs, diagrams. 5 ref. (G22)

142-G. (German.) **Stripper Pressure in Deep Drawing.** Erich Siebel. *Stahl und Eisen,* v. 74, no. 3, Jan. 28, 1954, p. 155-158.

Formation of wrinkles, deformation and buckling process. Diagrams, graphs, tables. (G4, Q28)

143-G. Discontinuous Chip Formation. N. H. Cook, Iain Finnie and M. C. Shaw. *ASME, Transactions,* v. 76, Feb. 1954, p. 153-162.

Influence of several variables with

regard to chip discontinuity. Examples to illustrate principal points. Diagrams, graphs, photomicrographs, table. 8 ref. (G17)

144-G. The Friction Terms in Metal Cutting. W. C. Leone and Edward Saibel. *ASME, Transactions,* v. 76, Feb. 1954, p. 195-197; disc., p. 197-198.

Results of an investigation of metal cutting. Diagrams, graphs, tables. 6 ref. (G17)

145-G. Predicting the Angle of Chip Flow for Single-Point Cutting Tools. L. V. Colwell. *ASME, Transactions,* v. 76, Feb. 1954, p. 199-203; disc., p. 203-204.

Method for predicting direction of tool shapes and cutting conditions. Graphs, diagrams. (G17)

146-G. On the Analysis of Cutting-Tool Temperatures. E. G. Loewen and M. C. Shaw. *ASME, Transactions,* v. 76, Feb. 1954, p. 217-225; disc., p. 225-231.

Analytical procedure to be followed in computing cutting temperatures presented and illustrated by several examples. Graphs, diagrams. table. 18 ref. (G17, SS, AY, Ti)

147-G. Friction Sawing Cuts Off High Costs. H. J. Chamberland. *Iron Age,* v. 173, Feb. 18, 1954, p. 152-154.

Equipment and economical operating characteristics. Photographs, tables. (G17)

148-G. Machining. *Iron Age,* v. 173, Feb. 18, 1954, p. 169-170.

New boring machine holds close concentricity. Photograph. (G17)

149-G. Magnesium Impacts. T. L. Patton. *Machine Design,* v. 26, Feb. 1954, p. 124-128.

Impact extrusion as a practical production method, broadening the possibilities of designing for lower cost. Photographs, tables, graph, diagrams. (G5, Mg)

150-G. Fundamentals of Production Tapping. R. H. Cowan. *Machinery (London),* v. 84, Jan. 29, 1954, p. 234-236.

Lubricants, design of work pieces and tapping fixtures. Diagram, photograph. (G17)

151-G. Grinding Hazards. W. R. Hardwick. *Metallurgia,* v. 49, no. 291, Jan. 1954, p. 21-25.

Grinding of tools is accompanied by local heat generation. Unless the operation is carried out correctly it can result in softening and cracking of surface of the tool. Effects may be aggravated by incorrect heat treatment prior to grinding. Photographs, micrographs, table, graph. (G18)

152-G. Manufacturing Aluminum Extruded Combination Doors. Walter Rudolph. *Modern Industrial Press,* v. 16, Feb. 1954, p. 13-14, 18, 22.

Fabrication procedures including drilling, punching and riveting. Photographs. (G17, G2, G5, K13, Al)

153-G. Seven Ways of Forming Magnesium Sheet. *Product Engineering,* v. 25, Feb. 1954, p. 135-141.

Data show that magnesium can be fabricated with less trouble than other sheet metals. Graphs, diagrams, tables. (G general, Mg)

154-G. The Forming of Aluminium Sheet. IV. Deep Drawing and Pressing. H. Hinxman. *Sheet Metal Industries,* v. 31, no. 322, Feb. 1954, p. 93-98.

Forming methods adopted with aluminum and its alloys, showing how these materials compare favorably with others in their response to drawing and pressing. Photographs, diagrams, drawing. 3 ref. (G4, G1, Al)

155-G. Stampings Offer Way to Cut Corners. *Steel,* v. 134, Feb. 15, 1954, p. 112-113.

Reports that 14-part assembly which required welding, machining and assembling can be incorporated into a single stamping. Photographs. (G3)

156-G. Aluminium Alloy and Stainless Steel Fabrication. *Welding and Metal Fabrication,* v. 22, Feb. 1954, p. 46-51.

Equipment and processing operations. Photographs.
(G general, K general, Al, SS)

157-G. The Development of Oxygen Cutting Machines. L. J. Hancock. *Welding and Metal Fabrication,* v. 22, Feb. 1954, p. 59-60, 61-63.

Trends in equipment. Techniques from first machines through modern ones. Photographs. (G22)

158-G. In the Fabrication Shop. *Welding and Metal Fabrication,* v. 22, Feb. 1954, p. 78-79.

Practical aspects of welding and metalworking. Photographs, diagrams. (G general, K general)

159-G. Heavy-Duty Carbides. *Western Machinery and Steel World,* v. 45, Feb. 1954, p. 94-95.

Heavy-duty steel cutting carbides have been developed that are suitable for severe cutting conditions. Photographs, micrographs.
(G17, C-n)

160-G. (French.) **Stabilization of Light-Alloy Castings.** *Fonderie,* 1953, Dec., no. 95, p. 3731-3732.

Causes and remedies of expansion

and deformations of castings which occur during machining. Table. (G17, EG-a)

161-G. (French.) **Technical Notes From the 5th International Congress of Mechanical Works in Turin.** *Métallurgie et la construction mécanique,* v. 85, no. 12, Dec. 1953, 30 p.

Includes machining by cutting tools and electricity; finishing; progress in foundry techniques; precision foundry work; stamping, forging, extrusion, flanging and cutting; powder metallurgy; welding procedures; and other joining methods. Graph, diagrams, photographs. (G general, E general, F general, H general, K general)

162-G. (Russian.) **Influence of Lubricants on the Coefficient of Friction During the Deep Drawing of Metals.** S. Ia. Veiler and G. I. Epifanov. *Doklady Akademii Nauk SSSR,* v. 92, no. 3, Sept. 21, 1953, p. 593-595.

Investigations on steel, brass and copper test specimens using nonlyic acid and butyl and methyl alcohol lubricants. Graph. 6 ref. (G21, ST, Cu, Zn)

163-G. A New Look at Cutting Fluids. Harry N. Leave. *American Machinist,* v. 98, Mar. 1, 1954, p. 97-99.

Factors to be considered in selection of fluid for particular application. (G21)

164-G. Magnesium Grinding Precautions. *Light Metal Age,* v. 12, Feb. 1954, p. 18-19, 32.

Fire hazard, dust, coolants and precautions. Photograph, diagrams. (G18, A8, Mg)

165-G. Light Alloy Torpedo Tubes. W. H. Dann. *Light Metals,* v. 17, Feb. 1954, p. 48-51.

Fabrication procedures including forming and arc welding. Photographs. (G general, K1, EG-a)

166-G. Lubrication in the Cutting of Metals. Antoni Niedzwiedzki. *Machinery (London),* v. 84, Feb. 12, 1954, p. 337-343.

Classification of cutting fluids; properties of cutting oils and aqueous emulsions and use of compressed gases as cooling media in metal-cutting operations. Graphs, diagrams, tables, photographs. (To be continued.) (G21)

167-G. Metal Working Lubricants. *Metal Industry,* v. 84, Feb. 1954, p. 151-152.

Problems affecting lubricants for cold drawing nonferrous metals and alloys. (To be continued.) (G21, EG-a)

168-G. Lubricants for Metalworking. *Metal Treatment and Drop Forging,* v. 21, Feb. 1954, p. 61-65.

Applications in nonferrous metal industries. (G21)

169-G. The Essential Elements of Die Forming. *Metal-Working,* v. 10, Mar. 1954, p. 16-19.

Typical forming dies for many varied uses. Diagrams, table. (G1)

170-G. Deep Draws Don't Follow Rules. J. Walter Gulliksen. *Steel,* v. 134, Mar. 1, 1954, p. 140-141.

Basic principles and variables to be considered. Diagrams, photographs. (G4)

171-G. Preventing Press Failures. Press Alignment and Speeds. A. F. Gagne, Jr. *Tool Engineer,* v. 32, Mar. 1954, p. 54-56.

Punching, blanking and drawing practice. Graph, photographs, tables (G1)

172-G. Basic Tooling for Spinning Metals. Francis L. Coenen. *Tool Engineer,* v. 32, Mar. 1954, p. 57-63.

Spinability of metals, spinning blocks, rollers, hand tools, lubricants and accessories. Photographs, diagrams, tables. (G13, SS, Mg)

173-G. Titanium, How to Deep Draw it. Carter C. Higgins. *Tool Engineer,* v. 32, Mar. 1954, p. 75-76.

Drawability of alloys, galling, seizing tendencies, die lubricants and chemical treatment of drawing blanks. Photographs. (G4, Ti)

174-G. Which Flame Was Faster? F. W. Sowa and W. C. Truckenmiller. *Welding Engineer,* v. 39, Mar. 1954, p. 43, 48.

Relative performance of acetylene and propane were tested as preheating gases for oxygen cutting of carbon steels. Photographs, table. (G22, CN)

175-G. Investigation of Lubricating Action in Deep Drawing Using a Model. S. Y. Veiler, L. A. Shreiner and P. A. Rebinder. *Henry Brutcher, Altadena, Calif., Translation no.* 3195, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 73, no. 3, 1950, p. 511-513.)

Previously abstracted from original. See item 336-G, 1950. (G4, G21)

176-G. The Deep Drawing and Pressing of Non-Ferrous Metals and Alloys. J. Dudley Jevons. Paper from "The Cold Working of Non-Ferrous Metals and Alloys". Institute of Metals, Monograph and Report Series no. 12. p. 107-163; disc., p. 165-206 + 4 plates.

A number of ordinary and special tests applicable to sheet and their limited usefulness in predicting behavior under the press. A method for routine acceptance testing of sheet under industrial conditions. Phenomena of stretcher-strain

markings and of season cracking. Photographs, micrographs, diagrams. 46 ref. (G4, G1, ST)

177-G. (Book.) **The Cold Working of Non-Ferrous Metals and Alloys.** Institute of Metals, Monograph and Report Series no. 12. 207 p. 1952. Institute of Metals, 4 Grosvenor Gardens, London, S.W. 1, England. $2.50.

From a symposium held at London, at the Annual General Meeting of the Institute, Mar. 14, 1951. Papers are separately abstracted. (G general)

178-G. (Book.) **Collected Papers 1953. Technical Papers and Panel Discussions (Annual Vol.),** v. 21, 1953. Sections individually paged. American Society of Tool Engineers, Detroit, Mich. $4.00

Discussions on machinability, metal working, adhesives and tool applications. Papers are separately abstracted. (G general, K12, T6)

179-G. Carbon-Dioxide Cooling. *Aircraft Production,* v. 16, Mar. 1954, p. 96-102.

Application as coolant in machining operations, methods of delivery to tool-point and storage. Diagrams, photographs, micrographs, graph. (G21, G17)

180-G. Stretch Aluminum Plate to Reduce Machining Distortion. W. J. Lawler and V. F. Binkley. *American Machinist,* v. 98, Mar. 15, 1954, p. 128-129.

Controlled stretching has a measurable effect on residual stresses and therefore will minimize, or even eliminate, distortion during extensive machining operations. Tables, photographs. (G17, Al)

181-G. Electrical-Discharge Machining. H. V. Harding, V. E. Matulaitis and R. C. Stoke. *American Machinist,* v. 98, Mar. 15, 1954, p. 137-148.

Report on arc machining describes process, its use, and where it can be applied in fabricating materials that are virtually unmachinable. Photographs, micrographs, osillograms, diagrams. (G17)

182-G. Metal Spinning. I. *Canadian Metals,* v. 17, Mar. 1954, p. 38, 40.

Reviews current literature. (G13)

183-G. Lead-Tin Alloy Coating Improves Workability of Strip Steel. E. J. Roehl. *Iron Age,* v. 173, Mar. 18, 1954, p. 140-142.

Strip steel, electrolytically precoated with a lead-tin alloy, offers important fabricating advantages. Coating acts as a lubricant, reducing wear on dies and forming rolls and eliminates or substantially reduces post-fabrication plating costs. Photographs. (G21, F1, L17, Pb, Sn)

184-G. Automatèd Units Speed Turning, Gaging. E. J. Egan, Jr. *Iron Age,* v. 173, Mar. 11, 1954, p. 144-145.

Automotive camshafts are automatically processed through two turning and gaging operations on bearing segments. Diagrams. (G17)

185-G. How to Press Form Titanium Parts. Paul Maynard and Andrew Eshman. *Iron Age,* v. 173, Mar. 11, 1954, p. 149-152.

Rubber pad, brake, stretch and drop hammer forming have been used to produce titanium production parts. Photographs, diagrams. (G1, F22, Ti)

186-G. Machining. Change in Tools Cuts Costs, Improves Finish. *Iron Age,* v. 173, Mar. 18, 1954, p. 152.

Improved finish on highly abrasive aluminum bronze die castings and considerably improved tool life attained through use of cemented carbide tooling. Photograph. (G17)

187-G. Permanent Magnets Cast as Close to Final Size as Possible Because of Difficulty in Machining; Use Disc, Centerless Grinders. *Machine and Tool Blue Book,* v. 49, Mar. 1954, p. 213-215.

Alnico is hard, brittle, hot short, impractical to machine and difficult to grind. Machining method is discussed. Photographs. (G17, G18, SG-n)

188-G. Deep Drawing of Molybdenum. F. Duckworth. *Machinery (London),* v. 84, Feb. 19, 1954, p. 389-390.

Molybdenum sheet, 0.010-in. thick, has been drawn into cylindrical cups with a length-to-diameter ratio of more than 2:1 using a new deep drawing technique. Diagrams, table, photograph. (G4, Mo)

189-G. Project Tinkertoy. *Metal Progress,* v. 65, Mar. 1954, p. 81-84.

Mechanized manufacture, inspection and assembly of radio gear, using modules or primary units for each electron tube stage, as evolved by the National Bureau of Standards. (G general, S general)

190-G. Stamping Company Cuts Production Costs by Using Pre-Coated Metal Coil. *Modern Industrial Press,* v. 16, Mar. 1954, p. 38, 40.

Changeover to precoated coil cut costs by one-third. Cleaning, spraying and baking of fabricated trays were eliminated, as were slitting of sheets and stacking of strips. Photographs. (G3)

191-G. Pre-Stressed Steelwork. R. A. Sefton Jenkins. *Overseas Engineer,* v. 27, Mar. 1954, p. 274-276.

Considerable economies in steel and erection costs attained by prestressing, especially if it is outside

depth of the beam. Diagram, photographs. 3 ref. (G23, ST)

192-G. Machining Titanium Alloys. *Screw Machine Engineering,* v. 15, Mar. 1954, p. 50-51.

Proper tools for special alloys and working problems. Diagrams. (G17, Ti)

193-G. The Forming of Aluminium Sheet. IV. Deep Drawing and Pressing. H. Hinxman. *Sheet Metal Industries,* v. 31, no. 323, Mar. 1954, p. 191-196, 202.

Diameter reduction of cylindrical, rectangular, tapered and domed shells. Blank-holder pressure, drawing speed, lubrication and ironing. Diagrams, tables, photographs. (To be continued.) (G4, G1, Al)

194-G. (German and French.) **Physical and Technological Basis of Oxygen Cutting.** C. G. Keel. *Zeitschrift für Schweisstechnik,* v. 44, no. 2, Feb. 1954, p. 34-44.

Effects of cutting on ferrous materials. Graphs, tables, diagrams. 15 ref. (G22, Fe)

195-G. (Hungarian.) **Development of Electrical Equipment for Machine Tools.** György Morvay. *Elektrotechnika,* v. 47, no. 2, Feb. 1, 1954, p. 35-49.

Starting control, changing speed and stopping the motion. Possibilities and limits for use of motors with stepless speed control. Diagrams, graphs. (G17)

196-G. (Russian.) **Surface Defects Appearing on Stannous Bronze During Turning.** A. P. Kuznetsov and I. I. Sikhonov. *Vestnik Mashinostroeniia,* v. 33, no. 11, Nov. 1953, p. 56-58.

Low feed, increased speed and a large negative rake will reduce number of defects. Photographs, graphs. (G17, Cu)

197-G. (Russian.) **Die Stamping of Parts From U8 and 3Kh13 Steel.** P. I. Kazakevich. *Vestnik Mashinostroeniia,* v. 33, no. 11, Nov. 1953, p. 65-68.

Forming methods producing best impressions. Chart, photographs, diagrams. (G3, CN)

198-G. (Russian.) **Investigation of the Process of Chip Formation by Using High Speed Movies.** S. V. Egorob. *Vestnik Mashinostroeniia,* v. 33, no. 11, Nov. 1953, p. 70-74.

Method used in Moscow Aviation Institute. Diagrams, photograph, micrographs. 4 ref. (G17)

199-G. Uniform Powder Flow Gives Better Cuts in Stainless. J. R. Kirwin and J. Holmstock. *Iron Age,* v. 173, Mar. 4, 1954, p. 156-157.

Uniform and minimum flow to cutting reaction zone results in consistently good oxy-acetylene cuts in stainless steel. Vibratory feeder dispenses iron powder. Photographs. (G22, SS)

200-G. How Plastics Cut Short Run Tooling Costs. Arthur A. Merry. *Iron Age,* v. 173, Mar. 4, 1954, p. 158-161.

Cast plastics used to advantage in making intricately contoured dies, checking fixtures, drill jigs with steel bushings, milling fixtures, baffle forms and trimline templates. Photographs. (G17)

201-G. Efficient Set-Ups For Operations on Grinding Machine Castings. *Machinery (London),* v. 84, Mar. 5, 1954, p. 471-479.

Methods employed in connection with production of surface grinder. Photographs, diagrams. (G18)

202-G. Magnetic Tape Control of Machine Tools. L. R. Peaslee. *Machinery (London),* v. 84, Mar. 5, 1954, p. 483-489.

Magnetic tape recorders employed to provide signals necessary to control moving members of machine tool throughout operating cycle. Photographs, diagrams. (G17)

203-G. Fabricating Special Purpose Copper Heat Exchangers. J. M. Van Nieukirken. *Materials & Methods,* **v.** 39, Mar. 1954, p. 140-142.

Flexible, coiled copper tubing offers a means of obtaining high-capacity heat transfer in a small space. Photograph, diagrams. (G general, Cu)

204-G. Machining and Assembling Carbide Header Die Nibs. *Metal-Working,* v. 10, Apr. 1954, p. 16-19.

Bolt heading dies must be designed so formed head of work is not completely confined within carbide nib. Nomograph, diagrams, table. (G17, C-n)

205-G. Guide for Machining Stainless Steels. I. J. D. Armour. *Steel,* v. 134, Mar. 22, 1954, p. 92-95.

Some free-machining types approach workability of bessemer screw stock. Nonfree-machining types offer top mechanical, corrosion properties. Photograph, diagrams, tables. (To be continued.) (G17, SS)

206-G. Rubber Pad Press Gets New Muscles. *Steel,* v. 134, Mar. 22, 1954, p. 98-100.

Working pad is displaced down over work by pumping hydraulic oil into fluid cell. More complete forming results because both face and side pressures are uniform. Photographs, diagrams. (G8)

207-G. Machining Stainless. II. Diagnosis of 274 Tool Headaches. J.

D. Armour. *Steel,* v. 134, Mar. 29, 1954, p. 106-108.

Tests on measuring machinability of steel. Photographs. (G17, SS)

208-G. New Tool for Roll Forming. *Steel,* v. 134, Mar. 29, 1954, p. 120-121.

Equipment and performance characteristics. Photographs, diagram. (G11)

209-G. Unconventional Automatic Die Draws Deep Extra-Shells Efficiently. Ernest J. Urbas. *Tooling and Production,* v. 19, Mar. 1954, p. 46-49.

Unorthodox "triple-multiple" die produces three identical finished shells at each stroke of the press. Photographs, diagram. (G4)

210-G. Abrasive Action in Titanium Grinding. Fred A. Upper. *Tooling and Production,* v. 19, Mar. 1954, p. 60-61.

Recommendations based on laboratory experiments and actual field practice for wheel speeds, wheel grit and grade and coolants for different grinding operations. Photographs. (G18, G21, Ti)

211-G. (German and French.) **The Suitability of Different Fuel Gases for Oxygen Flame Cutting.** Hans Georg Kunz. *Zeitschrift für Schweisstechnik,* v. 44, no. 3, Mar. 1954, p. 53-63.

Relative values of acetylene, illuminating gas, propane and hydrogen in flame cutting. Effects on quality of the cut and properties of metals. Diagram, graphs, micrographs, photographs, tables. (To be continued.) (G22)

212-G. Gear-Cutting Savvy in 16 Easy Steps. Richard S. Hildreth. *American Machinist,* v. 98, Mar. 29, 1954, p. 99-103.

Quick, clear-cut introduction to various gear-cutting processes. Photographs, diagrams. (G17)

213-G. Roll Flowing Saves Operation and Conserves Material. Claus L. Sporck. *American Machinist,* v. 98, Mar. 29, 1954, p. 104-107.

Floturn process of metal spinning. Photographs, micrographs, diagrams. (G13)

214-G. Automation Combines Standard Lathes. E. J. Tangerman. *American Machinist,* v. 98, Mar. 29, 1954, p. 110-113.

Two standard lathes equipped with automatic handling take parts from and to conveyor, with interlocked gaging to indicate any tolerance giving trouble. V-shape slide carrier inserts or removes parts from chucks 6 in. deep, retracts to clear cutting zone. Photographs, diagrams. (G17)

215-G. Why Would You Choose Hydraulic Presses? *American Machinist,* v. 98, Mar. 29, 1954, p. 116-126.

Basic reasons for increasing acceptance of modern hydraulic press for jobbing and production work. Diagrams, photograph. (G1)

216-G. The "Dual Coolant" Cooling Method for Grinding. G. Pahlitzsch and J. Applun. *Engineers' Digest,* v. 15, Mar. 1954, p. 91-95. (From *Werkstattstechnik und Machinenbau,* v. 43, no. 11, Nov. 1953, p. 487-494.)

Method utilizes two different fluids supplied to point of contact between grinding wheel and work separately but simultaneously. Graphs, diagrams. 18 ref. (G18)

217-G. Iron Powder Speeds Cutting of Stainless Steel and Non-Ferrous Alloys. R. S. Babcock. *Industry & Welding,* v. 27, Apr. 1954, p. 54-56, 98.

Materials, equipment and techniques of powder-cutting. Photographs. (G22)

218-G. Designing for Oxygen Cutting. John Mattingly. *Industry & Welding,* v. 27, Apr. 1954, p. 66 + 7 pages.

Great progress in application of oxygen cutting made possible by development of precision equipment and widespread acceptance of process. Photographs, diagram. (G22)

219-G. Bore Heavy Tubing Faster on New Trepanning Lathe. *Iron Age,* v. 173, Apr. 1, 1954, p. 129.

Equipment and performance characteristics. Photograph. (G17)

220-G. Planned Safety Reduces Press Accidents. C. E. Meldrum. *Iron Age,* v. 173, Apr. 1, 1954, p. 134-137.

Better press methods and improved safety devices sharply reduce accidents. Photographs. (G1, A7)

221-G. A Study of the Role of the Cutting Fluid in Machining Operations. S. J. Beaubien and A. G. Cattaneo. *Lubrication Engineering,* v. 10, Apr. 1954, p. 74-79.

Cutting fluids studied with object of understanding mechanisms which link fluid properties and metal cutting performance. Photographs, graphs, diagrams. 1 ref. (G21, G17)

222-G. When Drilling 1½" to 5" Holes, Spade Drills Are Economical, Efficient. W. F. Schleicher. *Machine and Tool Blue Book,* v. 49, Apr. 1954, p. 182 + 5 pages.

Compared with twist drills. Use and grinding. Photograph, diagrams. (G17, G18)

223-G. Wheel Characteristics in Relation to Production by Grinding. *Me-*

chanical World and Engineering Record, v. 134, Mar. 1954, p. 105-107.
Characteristics of grinding wheels, their applications and limitations. Diagrams, tables. (G18)

224-G. Case History no. 14. Machining Stainless Steel. G. J. Stevens. *Modern Machine Shop,* v. 26, Apr. 1954, p. 135.
Problem of threading ends of large sized tubing solved by use of a spider to support tubing in chuck of lathe. Diagram. (G17, SS)

225-G. Floturn Process Is Newest Method for Metal Forming. *Modern Machine Shop,* v. 26, Apr. 1954, p. 136-139.
New spinning process is fast, low-cost and designed to save material. Photographs, diagram. (G13)

226-G. Angularity Control in Large Extruded Shapes. A. J. Naisuler. *Modern Metals,* v. 10, Mar. 1954, p. 61-62.
Die making in extrusion of a modified "J" section. Diagrams. (G5, Al)

227-G. Trepanning Quick Shift to High Gear. *Steel,* v. 134, Apr. 5, 1954, p. 103.
Advantages of adequate horsepower to spindle, high-spindle speed range and high cutting fluid pressures. Photographs. (G17, G21)

228-G. A Quantity Producer Combats Its Limitations. Carter C. Higgins. *Steel,* v. 134, Apr. 5, 1954, p. 118-119.
Stamping industry makes constant progress against its competitive limitations. Under concentrated attack are tool charges, thickness variations, sharp radii and tolerances. Photographs. (G3)

229-G. The Elimination of Safety Hazards in Press Operation. Charles E. Meldrum. *Steel Processing,* v. 40, Mar. 1954, p. 174-180, 184.
Study determined location of hazardous operations and use of mechanical loading and unloading devices, standardization of die design for safety purposes and safety guard design. Table, photographs. 7 ref. (G1, A7)

230-G. Special Automatic Machines, Index Tables Permit Fuze Body Production Savings. M. D. Beals. *Western Metals,* v. 12, Mar. 1954, p. 35-38.
Design and building of special automatic machines to reduce labor costs and insure accuracy. Photographs. (G17)

231-G. (Book.) **New Methods for Sheet Metal Work.** W. Cookson. 4th Ed. 219 p. Technical Press Ltd., Gloucester Road, Kingston Hill, Surrey, London. 16s.
Modernizing and simplifying geometrical development procedure for laying out patterns on an exact basis. Includes two chapters on irregular surface perimeter calculations. (G3)

232-G. Foam Cooling Clings. James P. Mason and Edward B. Weber. *American Machinist,* v. 98, Apr. 12, 1954, p. 174-176.
Inexpensive foam-creating attachments on standard coolant lines cut splashing and cause coolant to cling to rapidly moving tools and workpieces, adding to tool life and improving work conditions. Photographs, diagram. (G21)

233-G. Carbide Cuts Carbide Chipbreakers. Anderson Ashburn. *American Machinist,* v. 98, Apr. 12, 1954, p. 185-187.
Chipbreaker ledges are cut in single-point carbide tools by electrical-discharge machine. Photographs, diagrams, table. (G17)

234-G. Titanium and Steel Hot-Extruded on Coast. *American Machinist,* v. 98, Apr. 12, 1954, p. 256-257.
Steel extrusions made from 6 3/16-in. diameter billets and titanium extrusions from 5-in. diameter billets at pressures of 3000 psi. Photographs, diagram. (G5, SS, Al, AY, Ti)

235-G. A Review of Metal Spinning. II. *Canadian Metals,* v. 17, Apr. 1954, p. 38, 40, 42.
Reviews literature compiled by technical information service, N.R.C., Ottawa. (G13, Al)

236-G. Automatic Production of Beryllium Copper Parts for Business Machines. *Canadian Metals,* v. 17, Apr. 1954, p. 57-58, 60.
Electrical contacts for accounting equipment are used in quantities that warrant production on automatic machines. Beryllium copper alloy gives desired physical properties and durability. Photographs. (G17, T10, Be, Cu)

237-G. Cutting Oil Dermatitis. *Canadian Metals,* v. 17, Apr. 1954, p. 62.
Cause and prevention among employees using cutting oils as cooling agents. (G21, A7)

238-G. An "A.B.C." of Cold Extrusion of Steel. John Perry. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 503, Mar. 1954, p. 132-135; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 64-67.
Lubrication, process techniques, tool materials, equipment, steel composition, testing procedures. Diagrams, graphs. (G5, ST)

239-G. Radiator Core Making Plant. *Engineer,* v. 197, Apr. 2, 1954, p. 491-493.

Equipment and operating procedures. Includes tube rolling, tinning, forming, cutting and soldering. Photographs. (G general, L16, K7)

240-G. Economic Factors Must Govern Wheel Selection for Grinding Carbides. F. J. Lennon, Jr. *Industrial Diamond Review,* v. 14, Mar. 1954, p. 53-56.

Data pertaining to wheel cost per cubic inch of carbide ground means very little unless comparison is based on identical operations. Guide for wheel selection. Photographs. (G18)

241-G. High-Speed Hobbing Results in Important Savings. *Machinery,* v. 60, Apr. 1954, p. 178-183.

Remarkable reductions in production time are being achieved, hob life is lengthened, and where subsequent finishing of the gear teeth is required, feed rates used can be boosted to expedite operation. Photographs, graph. (G17)

242-G. Present-Day Techniques of Spinning Aluminum. J. R. Young. *Machinery,* v. 60, Apr. 1954, p. 194-201.

Spinning is finding widespread application in the production of sheet metal parts for which other methods of fabrication are not feasible. Low cost of tooling is dominant factor in choice of spinning as against drawing or forming as a production method. Photographs, diagrams, table. (G13, Al)

243-G. Carbides—Advantages and Limitations. C. H. Good. *Machinery,* v. 60, Apr. 1954, p. 202-205.

Applications for carbides, equipment and techniques for their use. Photographs, graph, micrographs. (G17, SG-j)

244-G. Electromechanical Spot-Drilling Reduces Costs. Raymond H. Spiotta. *Machinery,* v. 60, Apr. 1954, p. 229-232.

Equipment, techniques and operating characteristics. Photographs, diagram, chart. (G17)

245-G. High-Speed Broaching of Motor-Car Engine Castings. J. J. Wetzel. *Machinery (London),* v. 84, Mar. 19, 1954, p. 598-603.

Parts for V-8 engine are produced rapidly and economically by use of large horizontal broaching machines equipped with planer-type, inserted, tungsten carbide-tipped broaching tools, and operating at speeds up to 200 ft. per min. Photographs, diagrams. (G17)

246-G. The Production of Plastic Moulded Commutators. *Machinery (London),* v. 84, Mar. 26, 1954, p. 627-636.

Impact extrusion equipment and techniques. Photographs, diagram. (G5, Cu)

247-G. New Extrusion Techniques Developed. H. Albers, G. Krause and A. Greensite. *Mechanical Engineering,* v. 76, Apr. 1954, p. 343-345.

Extrusion presses utilized to produce longitudinally tapered, step and multi-shouldered extrusions, as well as combination die forgings and extrusions. Diagrams. 8 ref. (G5, F22)

248-G. Extruding Thin-Walled Tubing. *Metal Industry,* v. 84, Mar. 19, 1954, p. 225-226.

Impact extrusion process permits rapid production of seamless aluminum tubes with scratch-free surfaces and walls that are 0.0065 in. thick within tolerances of ±0.0005 in. Photographs. (G5, Al)

249-G. Impact Extrusions. Bernard F. Wade. *Product Engineering,* v. 25, Apr. 1954, p. 173-175.

Typical examples for different classes of impact extruded shapes. Table, photographs. (G5, Al)

250-G. How to Cut Those Metal-Working Blues. R. E. Crawford. *SAE Journal,* v. 62, Apr. 1954, p. 64-65.

Premature failure of carbide tools, tool mounting, refrigeration of cutting oils and when to replace tools. (G17, G21)

251-G. Experiences Pooled on Five Machining Problems. H. W. Ingalls. *SAE Journal,* v. 62, Apr. 1954, p. 66-68.

Considers machining impellers and integrally stiffened skins, cutter design, high tensile steels and titanium experiences. (G17, ST, Ti)

252-G. Spinning Operations Can Reduce Material Costs. *Screw Machine Engineering,* v. 15, Apr. 1954, p. 49-52.

Primary factor considered in using tubing is that cost is figured per linear foot rather than per pound. Use of tubing eliminates drilling operations. Drills can be replaced by rather inexpensive boring tools. Drawings. (G13)

253-G. New Machines and Methods. Walter P. Hill. *Tooling and Production,* v. 20, Apr. 1954, p. 47-50.

Production machines of the future will not be standard machines but will be specially designed for specific operations. Photographs. (G17)

254-G. The Evolution of a New American Machine Tool. Gordon Stephenson. *Tooling and Production,* v. 20, Apr. 1954, p. 51-53, 194.

New forming machine has ability to maintain close tolerances and power to cope with tough new alloys. Photographs. (G17)

255-G. **Cemented Carbides Perform Better on Better Machines.** Watson N. Nordquist. *Tooling and Production,* v. 20, Apr. 1954, p. 72-77.

To take advantage of present carbide tool performance, rigid and sturdy machine tools of 1954 should be considered. Photographs, table. (G17)

256-G. **Forming Sections With Form Die Quenching.** Joseph S. Corral. *Western Machinery and Steel World,* v. 45, Mar. 1954, p. 70-74.

Process combining forming and heat treating in one operation produces extremely accurate contours in high-strength aluminum alloy sheet; eliminates warpage and distortion normally occurring during water quenching. Photographs, drawings. (G general, J26, Al)

257-G. (French.) **Relation Between the Phenomenon of the Built-Up Edge in the Cutting of Metals and Hot Brittleness.** Paul Bastien and Michel Weisz. *Revue de métallurgie,* v. 51, no. 2, Feb. 1954, p. 73-84.

Measurement of cutting force, temperature and tensile tests at elevated temperatures. Machining tests on chromium-molybdenum steel used with three structures. Conditions under which various types of chip are obtained. Tables, micrographs, diagrams, graphs. 6 ref. (G17, Q23, AY)

258-G. (German.) **Research on Flame-Cutting With Block-Type Nozzles.** E. Zorn. *Schweissen und Schneiden,* v. 6, no. 3, Mar. 1954, p. 105-108.

Comparison with efficiency of two-piece nozzles. Graphs, diagrams, photograph. (G22)

259-G. (Russian.) **Hardening of Shafts by Surface Cold Hardening.** I. V. Kudriavtsev and S. I. Iatskevich. *Vestnik Mashinostroeniia,* v. 33, no. 10, Oct. 1953, p. 68-71.

Experimental results on adjusting ring seats. Increased fatigue strength. Graphs, photographs, micrographs, table, diagrams. 3 ref. (G23, Q7, J2)

260-G. (Russian.) **Increased Productivity by Anodic-Mechanical Tool Dressing.** A. I. Petrov and A. V. Glazkov. *Vestnik Machinostroeniia,* v. 33, no. 10, Oct. 1953, p. 75-79.

New process of dressing hard alloy tools. Advantages and disadvantages. Diagrams, table, graph. (G18, TS)

261-G. (Swedish.) **Hobbed Cavities for Compression and Injection Molds.** C. Ostman. *Svenska Plast Föreningen Tekniska Meddelanden,* v. 9, no. 3, Feb. 1954, 5 p.

Types of cavities suitable for hobbing, details of process. Diagrams. (G17, TS)

262-G. (Swedish.) **Some Factors Influencing Cold Hobbing of Molds for Plastics.** G. Folke. *Svenska Plast Föreningen Tekniska Meddelanden,* v. 9, no. 4, Feb. 1954, 11 p.

Effects of cold working on microstructure and flow properties. Special emphasis on low-carbon 4% chromium-molybdenum steel. Tables, graphs, micrographs, photographs, diagrams. 6 ref. (G17, AY, TS)

263-G. **Cold Forming Has Many Advantages for Making Automotive Parts.** Joseph Geschelin. *Automotive Industries,* v. 110, Apr. 15, 1954, p. 34 + 8 pages.

Major advantages. Photographs, micrographs, drawing, diagrams. (G general)

264-G. **Grinding Operations in the Cleaning Room.** Glenn S. Eisaman. *Foundry,* v. 82, May 1954, p. 384 + 4 pages.

Equipment and techniques. Photograph. (To be continued.) (G18)

265-G. **How to Eliminate Vibration, Torque and Bounce in Weld Grinding.** *Industry & Welding,* v. 27, May 1954, p. 74-76, 78-79.

New unit makes it possible to apply full face contact of raised hub disk wheels, abrasive disks, and cup wheels without objectionable bounce and torque. It increases speed of operation and quality of work. Photographs, diagram. (G18)

266-G. **Precision Stampings. Progressive Die Setups Permit High Output.** J. I. Feldborg. *Iron Age,* v. 173, Apr. 22, 1954, p. 170-173.

Precision and high production achieved by a 350-ton, five-station progressive die setup. Setup requires minimum time for die and coil changes. Photographs, diagram. (G3)

267-G. **Automatics Can Show Profits on Short Runs.** Dale Stoneman. *Iron Age,* v. 173, Apr. 22, 1954, p. 173-176.

New machines feature speed, accuracy, low setup time, make small lot production profitable and eliminate human factor. Puts machining on pushbutton basis. Photographs. (G17)

268-G. **Cutting Fluids. Proper Selection Leads to Better Machining.** James McElgin. *Iron Age,* v. 173, Apr. 22, 1954, p. 177-179.

With new hard and tough alloys, cutting fluids have increased in importance. They reduce friction, improve work quality, save on tools and dissipate heat. Graphs, photograph. (G21)

269-G. New Techniques Expand Uses for Plastic Tooling. W. G. Patton. *Iron Age,* v. 173, Apr. 22, 1954, p. 180-183.

Accurate, highly serviceable plastic checking and locating fixtures are now made in 24 hr. with weight savings of 50% or more. Photographs. (G17)

270-G. High Speed Machining Improves Quality, Cuts Costs. R. B. Brooks. *Iron Age,* v. 173, Apr. 22, 1954, p. 184-186.

Better quality at lower cost favors high over low-speed machining. Tool life equals and surpasses that obtained at slower speeds. Machines must be rigid. Photographs, diagram. (G17)

271-G. Threading With Carbon Dioxide Coolant. *Machinery (London),* v. 84, Apr. 2, 1954, p. 695-698.

Cooling method used on high-tensile steels. Advantages and possibilities. Photographs, diagram. (G21, ST)

272-G. Time Microscopy. *Machinery (London),* v. 84, Apr. 2, 1954, p. 701-704.

Mechanism of slow motion camera frequently employed to advantage in investigation of such phenomena as cutting actions of tools and cutters of a wide variety of forms. Photographs. (G17)

273-G. Trouble-Shooting in the Press Room. Federico Strasser. *Modern Industrial Press,* v. 16, Apr. 1954, p. 56, 58.

How to avoid sticking of small slugs in die plates. Diagrams. (G1)

274-G. The Hydroform as a Production Tool. Lester F. Spencer. *Steel Processing,* v. 40, Apr. 1954, p. 243-248.

Essential difference between hydroform and the conventional press used for draw forming is in tooling. Economic advantages and operating procedures. Photographs, table, diagrams. 5 ref. (G8)

275-G. Deep Drawing of 17% Chromium Iron. W. D. Pritchard. *Sheet Metal Industries,* v. 31, no. 324, Apr. 1954, p. 300.

Details of new controlled grain size aluminum bronze die material. (G4, Cu, SS)

276-G. Dies for Bending Operations. Federico Strasser. *Sheet Metal Industries,* v. 31, no. 324, Apr. 1954, p. 339-340.

Design considerations for various 90° forming dies. Diagrams. (G6)

277-G. The Right Chip Breaker. *Steel,* v. 134, Apr. 26, 1954, p. 98-101.

Longer tool life, better machining tolerances and surfaces, easier chip disposal and safer machine operation are benefits of good breaker design. Tips on procedure. Graphs, tables, diagrams. (G17)

278-G. Tips to Lower Tooling Costs. A. S. Hecker. *Steel,* v. 134, Apr. 19, 1954, p. 138-139.

Responsibility for producing finer tools at lower prices rests with process planner and tool designer. Nine tips to aid intelligent planning. (G17)

279-G. Peening Investigations. *Welding Journal,* v. 33, Apr. 1954, p. 206S-208S.

Interpretive report by the Peening Committee, Welding Research Council, based upon two reports issued by the American Bureau of Shipping Laboratory and a report issued by the Naval Research Laboratory. 6 ref. (G23)

280-G. New Deep Drawn Aluminum Machine Stock Provides Peak Machining Production. *Western Metals,* v. 12, Apr. 1954, p. 56-57.

Deep drawing material under extremely high pressure works aluminum rod and bar in such a manner that completely new metallurgical structure of metal is obtained. Photographs. (G17, G4, Al)

281-G. (French.) **Tool Shaping of Thin Sheet Pieces.** R. Dupas. *Métallurgie et la construction mécanique,* v. 86, no. 3, Mar. 1954, p. 179, 181-183.

Production by stamping, perforating, flanging, punching and cambering. Diagrams. (G3, G2)

282-G. (French.) **Principles of Deep Drawing.** B. Wassilieff. *Métallurgie et la construction mécanique,* v. 86, no. 3, Mar. 1954, p. 185-186, 189, 191.

Influence of outer radius and clearance of die and punch, diameter of mold, mold clamp and redrawing. Diagrams, graph. 3 ref. (G4)

283-G. (French.) **Modern Oxygen-Cutting Material.** L. Bothorel. *Métallurgie et la construction mécanique,* v. 86, no. 3, Mar. 1954, p. 193 + 6 pages.

Use of high-pressure monoblock and low-pressure heads for blow torches, gouging heads and oxygen cutting with flux. Electronic control and different guiding methods. Diagrams, photographs, table. (G22)

284-G. (German and French.) **The Suitability of Fuel Gases for Oxygen**

Cutting. Georg Kunz. *Zeitschrift für Schweisstechnik,* v. 44, no. 4, Apr. 1954, p. 83-86.

Shows acetylene to be most economical. Tables, graphs. (G22)

285-G. (Russian.) **Selection of Rational Initial Length of Rolled-Section Steel for Stamping.** V. L. Raskind. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 49-53.

Cost-reducing mathematical approach in determining most expedient lengths. Tables, graph, diagrams. (G3, ST)

286-G. **Modern Broaching Technique.** *Mechanical World and Engineering Record,* v. 134, Apr. 1954, p. 155-157.

Modern technique in metal cutting with various types of broaches. Diagrams, tables. (G17)

287-G. **Machining and Installing Oil-Impregnated Bearings.** *Metal-Working,* v. 10, May 1954, p. 14-15.

Bronze bearing metal machined best with standard tungsten-carbide tools. Precautions listed. Diagrams, table. (G17, Cu)

288-G. **Applying Safe Practices to Grinding and Polishing Magnesium Alloys.** *Metal-Working,* v. 10, May 1954, p. 18-19.

Grinding hazards, wheel selection, safety, polishing and dust collection. Table, diagrams. (G18, A7, L10, Mg)

289-G. **How to Machine Titanium.** *Steel,* v. 134, May 3, 1954, p. 96-98.

Chief problem is short tool life cause abrasiveness, galling and high tool-tip temperatures. Graphs. (G17, Ti)

290-G. **Chip-Breaking.** Oscar Schnellmann. *Aircraft Production,* v. 16, May 1954, p. 168-172.

Applying a continuously variable tool feed to existing equipment for producing short-length swarf. Tables, diagrams, photographs. (G17)

291-G. **Cope Talks on Draw Dies. XII. Tapered Shells Require Skillful Operation Layout.** Stanley R. Cope. *American Machinist,* v. 98, May 10, 1954, p. 168-171.

Rules and applications for drawing tapered shells. Layout of preliminary shells. Diagrams. (G4)

292-G. **Drop Hammer, Trapped Rubber Dies Form Aircraft Parts Faster.** T. M. Rohan. *Iron Age,* v. 173, May 6, 1954, p. 121-123.

Materials, equipment, techniques and applications. Table, photographs. (G8, Al, SS)

293-G. **Titanium Machinability for Management. I.** *Iron Age,* v. 173, May 6, 1954, p. 128-131.

Feeds, speeds, tool life, power requirements and other important data. Graphs, table, diagrams. (G17, Ti)

294-G. **Effect of Shot-Peening Variables and Residual Stresses on Fatigue Life.** R. L. Mattson and W. S. Coleman, Jr. *Metal Progress,* v. 65, May 1954, p. 108-112.

Abridged from paper presented before Society of Automotive Engineers, Oct. 1953, Hershey, Pa. Results of tests on leaf spring specimens. Graphs, photograph. (G23, Q7, ST)

295-G. **Drawing Stainless, How to Make It Fit Your Product.** *Steel,* v. 134, May 10, 1954, p. 134-135, 137.

Careful attention to properties can make stainless a significant factor in product design. Profitable production of shapes. Photographs, graph, table. (G4, SS)

296-G. **Use of Gas-Shielded Arc Processes for Cutting Non-Ferrous Metals.** W. G. Hull. *Welding and Metal Fabrication,* v. 22, May 1954, p. 188-191.

Argon and self-adjusting arc processes used for cutting materials not amenable to oxygen cutting. Photographs, tables. 2 ref. (G22, EG-a)

297-G. **Advanced Automatic Flame Cutting for Machinery Weldments.** Howard B. Cary. *Welding Journal,* v. 32, Oct. 1953, p. 957-965.

Chain flame cutting in fabrication of weldments for power shovels. Photographs. 3 ref. (G22)

298-G. **Recent Developments in Powder Processes.** R. S. Babcock. *Welding Journal,* v. 32, Oct. 1953, p. 986-991.

Extends use to scarfing blooms and billets; powder washing steel castings; and cutting nonferrous metals and fire-brick. Photographs. (G22)

299-G. (German.) **Jigs and Fixtures for Oxy-Acetylene Cutting.** Hans von Hofe. *Schweissen und Schneiden,* v. 6, no. 4, Apr. 1954, p. 145-154.

Cutting of parts with plane and curved surfaces. Photographs, diagrams. 8 ref. (G22)

300-G. (Russian.) **Investigation of Wear of a Cutting Tool by Means of Radioactive Isotopes.** E. P. Nadeinskaia. *Izvestia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 1, Jan. 1, p. 24-40.

Influence of machining time, cutting speed, depth of cut, feed rate and cooling agent on the wear of hard-alloy tool. Photographs, graphs. (G17, Q9, TS)

301-G. (Russian.) **Milling of Cast Iron Objects With Mineral Ceramic Tools.**

D. K. Margulis. *Stanki i Instrument,* v. 25, no. 2, Feb. 1954, p. 7-15.

Influence of various factors on wear and strength of cutters. Diagrams, graphs, photograph. (G17, CI)

302-G. How to Bend Aluminum Tube and Bar. J. M. Adle. *American Machinist,* v. 98, May 24, 1954, p. 137-144.

Compares methods for cold bending, analyzes tooling and lubrication. Photograph, diagrams. (G6, Al)

303-G. Machining Titanium With Coolants. *American Machinist,* v. 98, May 24, 1954, p. 155, 157, 159.

Effects on tool life by various liquid and gaseous coolants. Graphs, table. (G17, G21, Ti)

304-G. Recent Developments in the Theory and Design of Electric Spark Machine Tools. E. M. Williams, J. B. Woodford, Jr., and Richard E. Smith. *Applications and Industry,* 1954, no. 12, p. 83-86; disc., p. 87-88.

Results of research into fundamental processes, design trends in electric circuits of spark machine tools. Oscillograms, micrographs, graphs, tables. 8 ref. (G17)

305-G. On the Theory of Regenerative Chatter in Precision-Grinding Operations. R. S. Hahn. *ASME, Transactions,* v. 76, May 1954, p. 593-597; disc., p. 597.

Analysis based on proportionality of instantaneous wheel depth of cut to instantaneous dynamic force existing between wheel and work. Diagrams, graphs. 8 ref. (G18)

306-G. An Experimental Study of Metal Extrusions at Various Strain Rates. J. Frisch and E. G. Thomsen. *ASME, Transactions,* v. 76, May 1954, p. 599-606; disc., p. 606.

Particle velocities, magnitude and direction for inverted extrusion process using a sharp-edged die, determined on a meridian plane by stepwise method. Wall and mean pressures obtained. Photograph, graphs, diagrams, tables. 7 ref. (G5)

307-G. Some Observations on an Overseas Tour of Production Engineering Research Centres. C. A. Gladman. *Australasian Engineer,* 1954, Mar. 8, p. 47-55.

Organization and work of typical research organizations in Europe, Britain and U.S.A. Influence of metallurgy on machinability, vibration dampers for boring quills, rotary cutting tool, spark machining and electrolytically assisted grinding. Graphs, diagrams. (G17, G18, A9)

308-G. The Grinding of Steel. XVIII. Lapping. *Edgar Allen News,* v. 33, May 1954, p. 111-112.

Abrasives need not be coarse. Range available goes from 60 to 1000 grit; 150 is usually used. (To be continued.) (G19)

309-G. Abrasive Finishing. Gilbert C. Close and R. Stanley Burt. *Finish,* v. 11, June 1954, p. 24-27.

Compounds, equipment and techniques employed for lapping metal surfaces. Diagrams, photographs. (G19)

310-G. Traveling Pressure Shoe Extends Stretch Forming Uses. Henry Hein. *Iron Age,* v. 173, May 20, 1954, p. 141-143.

Machine makes accurate arcs and circles from tough alloys. Photographs. (G9)

311-G. Titanium: Airforce Machinability Report. II. *Iron Age,* v. 173, May 20, 1954, p. 144-147.

Routing, drilling, tapping and sawing methods. Photographs. (G17, Ti)

312-G. Deep-Drawing Properties of Sheet Steel. Fundamental Principles and Test Methods. Olov Svahn. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 129-142.

Survey of research project started in 1945. Two standard tests proposed. Diagrams, tables, photographs, graphs. 47 ref. (G4, CN)

313-G. Cold Heading. Frank C. Boyd. *Machine Design,* v. 26, May 1954, p. 187-190.

Recent developments in this familiar production technique have opened new opportunities for cost saving in design. Photographs, diagrams. (G10)

314-G. Factors Influencing the Tapping of Titanium. *Metal-Working,* v. 10, June 1954, p. 14-15.

Hole specifications, cutting fluids and tap selection. Tables, photographs, diagram. (G17, G21, Ti)

315-G. Impact Extruding Magnesium. C. Ridgely Kemp. *Modern Metals,* v. 10, May 1954, p. 44, 46.

Advantages and limitations. Photographs. (G5, Mg)

316-G. Assembly Machines Contribute to: Reduced Production Costs. Improved Quality. C. A. Nichols and W. A. Fletcher. *SAE Journal,* v. 62, May 1954, p. 34-37.

Abridged from "Designing and Building High-Speed Production Assembly Machines," presented at SAE National Production Meeting, Chicago, Mar. 1954. In-line machines for automatic machining of major components can cut costs and improve quality. Photographs, diagram. (G17)

317-G. Statistical Controls Lengthen Life of Cutting Tools. W. H. Seacord and F. L. Helmel. *SAE Journal,* v. 62, May 1954, p. 55-57.

Abridged from "Statistical Control Methods as Applied to Cutting Tools" presented at SAE Annual Meeting, Detroit, Jan. 1954. Statistical control of gear hobs, milling cutters, broaches, form tools and other cutting tools lower costs. Photograph, graph, chart. (G17, S12)

318-G. Forming Proves Able Grappler in Aircraft Arena. R. E. Furgeson. *SAE Journal,* v. 62, May 1954, p. 78-83.

Abridged from secretary's report of Panel on Forming SAE Aircraft Production Forum, Los Angeles, Sept. 1953. Rubber, stretch and draw forming. Photographs, diagrams. (G8, G9, G4, Ti)

319-G. How to Grind Titanium. C. I. Bradford. *Steel,* v. 134, May 17, 1954, p. 118-119.

Selection of proper wheels, use of effective coolants and correct wheel feeds. Photographs. (G18, G21, Ti)

320-G. Life in a Roll Grinding Shop. Thomas A. Kindre. *Steelways,* v. 10, June 1954, p. 17-19.

How experts repair and maintain rolls in steel mill. Photographs. (G18, ST)

321-G. Preventing Press Failures. Maintenance and Operation. A. F. Gagne, Jr. *Tool Engineer,* v. 32, June 1954, p. 54-58.

Preventive maintenance with detection and load control devices can usually prevent power-press smashups. Diagram, photographs. (G1)

322-G. Bending Aluminum Tubing. J. E. Hawking. *Tool Engineer,* v. 32, June 1954, p. 59-60.

Tests made on tubing ranging in diameter from ½ to 1¾ in., and in various alloys, wall thicknesses, and tempers to determine which sizes and alloys could be successfully bent to centerline radii of 1 or 2 diameters. Table, photographs. (G6, Al)

323-G. High-Speed Hobbing. J. W. Rapp. *Tool Engineer,* v. 32, June 1954, p. 77-80.

Abstracted from paper 22T32-1, "Hobbing Gears at High Speed", presented at 22nd ASTE Annual Meeting. Gear hobbing production can be increased by 100 to 150% without additional equipment, manpower, tool cost or tool maintenance. Research data offered in support. Photographs, graphs. (G17)

324-G. Machining Titanium. G. T. Fraser. *Tool Engineer,* v. 32, June, 1954, p. 81-83.

Abstracted from paper 22T36. "What is Known Today About Machining Titanium", presented at the 22nd ASTE Annual Meeting. Developments in all forms of machining. Table. (G17, Ti)

325-G. Shielded-Metal-Arc Cutting and Grooving. Helmut Thielsch and Joseph Quaas. *Welding Journal,* v. 33, May 1954, p. 438-446.

Principles of method. Characteristics and development of special coatings; cutting and grooving of mild steel, stainless steel, cast iron and copper; effects of electrode diameter, current, cutting speed. Photographs, diagrams, graphs, tables. 1 ref. (G22, ST, SS, CI, Cu)

326-G. More About Aluminium Lubrication. George Nicol. *Wire Industry,* v. 21, May 1954, p. 503-508.

Drawing problems and varieties of lubricants. (G21, G4, Al)

327-G. (German.) **Investigation on the Machinability of Steels as Dependent on Heat-Treatment. Mechanical Properties and Structure of Steels Tested.** Hans-Joachim Wiester. **Effect of Heat Treatment of Steels on the Main Cutting Power in Turning.** Otto Kienzle and Hans Victor. **Effect of Heat Treatment of Steels on Machinability in Turning and Boring With High Speed Steel Tools.** Walther Leyensetter and Erhard Kaluza. *Stahl und Eisen,* v. 74, no. 9, Apr. 22, 1954, p. 526-551.

Tensile strength and examination of structure after various heat treatments. Tables, micrographs, graphs, diagrams, photographs. 53 ref. (G17, J general, ST)

328-G. (German.) **Lüder's Lines on Metal Surfaces—Their Formation and Prevention.** R. Ergang. *Umschau in Wissenschaft und Technik,* v. 54, no. 8, Apr. 15, 1954, p. 243-244.

Lines are visible in drawn steel or may cause cracking in enameled products. Annealing at 600 to 650° C. or predrawing beyond the 2 to 4% elongation will correct this phenomenon. Photographs, graphs. 5 ref. (G4, J23, ST)

329-G. (Russian.) **Machining of High-Strength Cast Iron.** N. N. Zorev and A. Ia. Artamonov. *Stanki i Instrument,* v. 25, no. 3, Mar. 1954.

Application of coolants; effect on machine tool. Table, graphs. (G17, G21, CI)

330-G. Cope Talks on Draw Dies. XIII. Iron Shells to Get Accurate Diameters or Smooth Finish. Stanley R. Cope. *American Machinist,* v. 98, June 7, 1954, p. 134-137.

To obtain ironing effect, clearances and diameter reduction are less. Diagrams. (G4)

331-G. Thermal Number Measures Efficiency of Metal Cutting. Kenneth J. Trigger. *American Machinist,* v. 98, June 7, 1954, p. 145-152.

Distribution of heat among workpiece, chip and tool is of prime importance in determining efficiency of operation. Graphs, diagrams. (G17)

332-G. Belt Grinding of Titanium. I-III. *American Machinist,* v. 98, June 7, 1954, p. 163, 165, 167.

Reference sheets for three alloys. Two types of wet belts were used, in three grits, at speeds from 1000 to 10,000 ft. per min., at various feeding pressures, and with various coolants. (G18, Ti)

333-G. Full Automation for Piston Pins. Joseph Geschelin. *Automotive Industries,* v. 110, June 1, 1954, p. 48-50.

Batteries of automatic equipment used to machine manifolds at Ford engine plant. Photographs. (G17)

334-G. Electric Eye Guides Continuous Flame-Cutting Action. H. B. Cary. *Iron Age,* v. 173, June 3, 1954, p. 120-123.

Equipment can cut all parts of one plate thickness for a weldment in one continuous operation. Eliminates most layout work. Photographs. (G22)

335-G. Transfer Machining of Armored Vehicle Hulls. T. L. Hallenbeck. *Machinery,* v. 60, June 1954, p. 163-167.

Accurate boring, facing, drilling and tapping of hulls are being performed on a 100-ft. long transfer machine. Photographs. (G17)

336-G. The Production of Headed Pins. *Machinery (London),* v. 84, May 14, 1954, p. 1021-1024.

Formed wire parts manufacture. Photographs, diagrams. (G11, Ni, Cu)

337-G. Developments in the CeDe-Cut Technique. *Machinery (London),* v. 84, May 14, 1954, p. 1033-1040.

Possibilities of liquid carbon dioxide as a cooling medium; satisfactory operating techniques. Photographs, diagrams. (G21)

338-G. Milling Machine Leads. S. W. Hugo. *Mechanical World and Engineering Record,* v. 134, May 1954, p. 198-201.

Method enables change gears for universal milling machine to be calculated quickly and accurately. (G17)

339-G. How to Cut Worms on a Hobbing Machine. Peter R. Noling. *Modern Machine Shop,* v. 27, June 1954, p. 116-122.

Procedure for cutting by hobbing and milling process, depending on number of threads on worm. Photographs, drawings. (G17)

340-G. Piercing Punch Calculation. Federico Strasser. *Modern Machine Shop,* v. 27, June 1954, p. 178-180, 182, 184.

Methods determine correctness of physical properties and dimensions of a punch for job at hand. Diagrams, table. (G2)

341-G. P&WA Is Shot Peening Over 400 Parts. H. J. Noble. *SAE Journal,* v. 62, June 1954, p. 44-46.

Improves fatigue resistance of aircraft parts by bonding together surface layers where fatigue failures often start. Photographs. (G23, Al)

342-G. Titanium Machining Problems Overcome With Proper Techniques. Fred Spiegl. *Western Metals,* v. 12, May 1954, p. 45-48.

Solutions considered as starting points for adaptations to particular requirements and available equipment. Photographs, tables, diagrams. (G17, Ti)

343-G. (Book.) **Metal Cutting Tool Handbook.** 3rd Ed. 689 p. Metal Cutting Tool Institute, 405 Lexington Ave., New York 17. $6.50.

Covers drills, reamers, counterbores, taps and dies, milling cutters, gear hobs, gear-shaper and gear-shaving cutters, broaching tools, and general engineering data. Nomenclature, types, sizes, suggested speeds and feeds, troubleshooting, and associated tabular data. (G17)

344-G. (Book.) **A Treatise on Milling and Milling Machines.** 3rd Ed. 910 p. 1951. The Cincinnati Milling Machine Co., Cincinnati 9, Ohio. $8.00.

Functions and operations of milling machines and milling attachments; cutting tools and technical data on metal cutting; practical applications of toolroom milling and die sinking; principles of fixture design; modern production methods; and selection of milling equipment. (G17)

345-G. (Book.) **U.S.A.F. Machinability Report, Vol. III. Titanium.** James Van Voast. 153 p. Curtiss-Wright Corp., Wood-Ridge, N. J. $4.60.

Includes turning, milling, routing, drilling, tapping, abrasive cutting, hacksawing, belt grinding, and surface grinding. (G17, Ti)

346-G. Chemical Milling. *Aero Digest,* v. 68, June 1954, p. 25-26.

Use of acid etching to produce tapered sheets, waffle grid sections

and other shapes that are difficult or expensive to machine. Photographs. (G general)

347-G. Low-Cost Plastic Dies Take on More Forming Jobs. W. G. Patton. *Iron Age,* v. 173, June 10, 1954, p. 115-117.

Production, product quality and life of dies for steel forming. Photographs, table. (G general, ST)

348-G. Springback in Metal-Forming. Federico Strasser. *Iron & Steel,* v. 27, June 1954, p. 235-236, 240.

Variation of spring steel and phosphor bronze, hard steel, medium hard steel and hard brass, soft steel, soft brass and medium hard aluminum and zinc. Diagrams, tables. (G general, ST, Cu, Al, Zn)

349-G. Laboratory Evaluation of Metal-Forming Lubricants. R. S. Barnes and T. H. Cafcas. *Lubrication Engineering,* v. 10, May-June 1954, p. 147-150.

Tensile-test machine adapted, by proper choice of test-piece size and die design, for evaluating lubricants for cup drawing, wire drawing and rolling. Photographs, tables. 3 ref. (G21, F1)

350-G. Improved Machinability in New Leaded Alloy Steel. W. E. Falberg. *Materials & Methods,* v. 39, June 1954, p. 90-92.

Method permits 25 to 50% faster cutting speeds. Lead acts as lubricant between cutting tool and chip. Photographs, tables. (G17, AY)

351-G. Killed Basic Bessemer Steel Has Good Cold Forming Qualities. Hubert Hauttmann. *Materials & Methods,* v. 39, June 1954, p. 142-144. (Translated from the German.)

Mechanical properties, effect of heat treatment and comparison with other steels. Table, photograph, graphs.
(G general, Q general, J general, ST)

352-G. Controlling Machine Tools Automatically. Frederick W. Cunningham. *Mechanical Engineering,* v. 76, June 1954, p. 487-490.

Automatic controls, developed to speed up production, range from mechanical to electronic devices. (G17)

353-G. New Cold Forming Process Saves Time and Material. Claus L. Sporck. *Product Engineering,* v. 25, June 1954, p. 186-189.

Combination of roll forming and spinning produces parts difficult or impractical to make by deep drawing. Micrographs, diagrams, photographs. (G11, G13, G4)

354-G. Electrospark Machining. *Product Engineering,* v. 25, June 1954, p. 288-290, 292.

Abstracted from "Electrospark Machining—Metal Removal Without Contact" by C. Paul Porterfield, paper presented at 18th Annual Machine Tool Electrification Forum, Westinghouse Electric Corp., Buffalo, April 1954. Contact-initiated discharge, electrolytic and spark-initiated discharge methods of electro-machining. Diagrams. 6 ref. (G17)

355-G. Electric Spark Machining. D. W. Rudorff and H. Drubba. *Research,* v. 7, June 1954, p. 216-220.

Method of machining metallic surfaces based on material removed by sparks. Applicable to drilling, cutting and grinding. Diagram, photograph. 14 ref. (G17)

356-G. Drilling With Twist Drills. Carl J. Oxford, Jr. *Screw Machine Engineering,* v. 15, June 1954, p. 43-46.

Investigates what actually happens at the drill cutting edges and under the chisel edge. Micrographs, photographs, diagrams, graphs. (G17)

357-G. Data Sheet 11-SS. Speeds & Feeds for Stainless Steel. *Screw Machine Engineering,* v. 15, June 1954, p. 69-71.

Data for turning, skiving, shaving, trepanning, box milling and forming. Tables. (G17, SS)

358-G. Pick the Right Carbide Tool. Bennett Burgoon, Jr. *Steel,* v. 134, June 7, 1954, p. 124-126.

Cutter selection must be equated to job requirements. Tool type, shape and carbide grade. Grade choice can be based on wear characteristics. Diagrams, table. (G17, C-n)

359-G. How to Form Titanium. C. I. Bradford. *Steel,* v. 134, June 7, 1954, p. 136-137.

Metal resists sudden movement but good results are obtained by working slowly. Photograph, diagrams. (G general, Ti)

360-G. Controlling Burr Formation in Stampings. Federico Strasser. *Steel Processing,* v. 40, June 1954, p. 361-363, 390.

Natural, variable and accidental causes. Diagrams. (G3)

361-G. Selecting the Right Drawing Compound for the Job. Frank M. Aldridge. *Tooling and Production,* v. 20, June 1954, p. 56-57, 178.

Review of soap and oil compounds. Diagrams, check list. (G21)

362-G. Exploratory Tests of the Air-Carbon Arc Cutting Process. A. R. Hard. *Welding Journal,* v. 33, June 1954, p. 261S-264S.

Removal of defective areas from metal parts and back gouging of welds in steel, stainless steel and aluminum. Tables, diagrams, photographs. (G22, ST, SS, Al)

363-G. Effect of Lubricants Upon Coefficient of Friction in the Deep Drawing of Metals. S. Ya. Veiler and G. I. Epifanov. *Henry Brutcher, Altadena, Calif., Translation no.* 3248, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 92, no. 3, 1953, p. 593-595.)

Previously abstracted from original. See item 162-G, 1954. (G21, ST, Cu, Zn)

364-G. (French.) **Microwelding of Built-Up Edge and Its Influence on the Average Temperature of the Tool-Metal Interface.** Félix Eugene. *Comptes rendus,* v. 238, no. 20, May 17, 1954, p. 1965-1966.

Machining tests with and without lubrication explain the nature of the fusion phenomena. Graph. (G17)

365-G. (German.) **Powder Gas Cutting, Its Development and Application.** Bruno Trzeciak. *Metallurgie und Giesserei Technik,* v. 4, no. 4, Apr. 1954, p. 179-182.

Physical and chemical basis for the process. Advantages and difficulties of iron powder cutting. Equipment used. Table, diagram, photograph, micrographs. (G22, ST, Fe)

366-G. (Russian.) **Investigation of Wear of Cutting Tools With Marked Atoms.** E. P. Nadeinskaia. *Vestnik Mashinostroeniia,* v. 34, no. 4, Apr. 1954, p. 40-50.

Principles of method and equipment used. Effects of time, speed, cooling and depth of cut. Diagrams, graphs. photographs. (G17, Q9)

367-G. (Russian.) **Study of Tool Wear by Means of Radioactive Isotopes.** N. F. Kazakov. *Vestnik Mashinostroeniia,* v. 34, no. 4, Apr. 1954, p. 50-56.

Installation and method of determining wear. Effects of various cutting parameters. Table, graphs, micrographs, photographs. 6 ref. (G17, Q9)

368-G. Hardening of Steel by Low Temperature Treatment. II. Antoni Niedzwiedski. *Canadian Metals,* v. 17, May 20, 1954, p. 45-46.

Cooling of cutting oils increases tool life and output. 16 ref. (G17, G21, TS)

369-G. Spinning of Metals. *Canadian National Research Council, Technical Information Service Report no.* 37, Mar. 1954, 20 p.

Critical review of literature from 1944 to 1953. (G13)

370-G. Reciprocal or Pendulum Milling. R. Dies. *Engineers' Digest,* v. 15, June 1954, p. 235-237. (From *Werkstatt und Betrieb,* v. 87, no. 4, Apr. 1954, p. 157-160.)

Advantages and limitations. Diagrams. (G17)

371-G. Titanium: Air Force Machinability Report. III. *Iron Age,* v. 173, June 10, 1954, p. 122-124.

Belt and wheel grinding techniques for finishing complex titanium parts. Photographs, graphs. (G17, Ti)

372-G. Develop New Method for Cold Rolling Splines. W. G. Patton. *Iron Age,* v. 173, June 24, 1954, p. 110-112.

New cold rolling technique developed by Michigan Tool Co. for splines, grooves and serrations promises better surface finish, reduction for hobbing and complete elimination of chip disposal. Photographs. (G11)

373-G. Design Tooling for Complete Automation. W. G. Patton. *Iron Age,* v. 174, July 1, 1954, p. 114-116.

Transfer press dies have solved problem of producing large volume of deep drawn pressed metal parts without manual handling between operations. Photographs, diagrams. (G4)

374-G. Increase Tool Life in Machining Nickel Plate. Norman Zlatin and W. H. Prine. *Iron Age,* v. 174, July 1, 1954, p. 118-120.

Optimum cutting speeds and tool geometry for machining electrodeposited nickel. Graphs, tables. (G17, Ni)

375-G. Machining Hard Materials by Ultrasonics. *Mechanical World and Engineering Record,* v. 134, June 1954, p. 260-261.

Machines for drilling, shaping, etc. of glass, ceramics, tungsten carbide, diamond and the like. Photographs, diagram. (G17)

376-G. Trends in Mechanical Press Design. Ernest C. Morse. *Modern Industrial Press,* v. 16, June 1954, p. 29 + 8 pages.

Developments in past decade and forecast of future improvements. Photographs. (G1)

377-G. How to Tool Up for Aluminum Cutting. Ralph Wohlforth and Walter Bloss. *Steel,* v. 134, June 28, 1954, p. 116-118.

Tool shapes for various machining operations. Diagrams, tables. (G17, Al)

378-G. Correcting Carbide Tool Troubles. David C. Kauffman. *Tool Engineer,* v. 33, July 1954, p. 35-42.

Ways of correcting tool burning, breaking, chipping and excessive wear, cratering, chip clogging and

rough finish of workpiece. Photograph, diagrams. (G17)

379-G. Cam-Actuated Dies Promote Economy. Arthur J. Stockwell. *Tool Engineer,* v. 33, July 1954, p. 67-70.

Circular and semicircular cams for dies stamping precision regulator parts. Photograph, diagrams. (G3)

380-G. The Tool Engineer Reference Sheets. Classification of Cutting Fluids by Use. R. G. Moyer. *Tool Engineer,* v. 33, July 1954, p. 83-84.

Abstracted from paper 22T1, "Rolled Extrusion of Thin-Walled Parts", presented at the 22nd ASTE Annual Meeting. Classifies metals by machinability ratings and lists operations by severity. Table. (G21, G17)

381-G. Press Working the Aluminum Alloys. Lester F. Spencer. *Tooling and Production,* v. 20, June 1954, p. 45-47, 172, 182.

Formability and drawing procedures. Tables, photographs, diagram. (To be continued.) (G1, G4, Al)

382-G. Coolant Filtration. George Cantelo. *Western Metals* v. 12, June 1954, p. 58-60.

Central coolant filtration system gives near 100% oil recovery. Diagram, photographs. (G21)

383-G. Machining. *Western Metals,* v. 12, June 1954, p. 78-79.

Lighter, stronger jet plane sections machined on new Douglas Behemoth. Photograph. (G17, Al)

384-G. Cutting. *Western Metals,* v. 12, June 1954, p. 84.

'Amazing Monstrosity' saw cuts 120 miles of aluminum without any resharpening. Photographs. (G17, Al)

385-G. Negative Lubricating Action of Some Liquid Media in the Deep Drawing of Metals. S. Ya. Veiler. *Henry Brutcher, Altadena, Calif., Translation no.* 3251, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 83, no. 5, 1952, p. 709-712.)

Previously abstracted from original. See item 310-G, 1952. (G4)

386-G. Effect of Water and Alcohol on the Grinding of Metals. V. D. Kuznetsov and V. D. Taranenko. *National Science Foundation Translation, no.* 181, Jan. 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 92, 1953, p. 49-52.)

Previously abstracted from original. See item 46-G, 1954. (G18, Al, Cu, Zn)

387-G. (French.) **Drilling, Trepanning, and Cutting Methods.** R. Canet. *Technique et science aéronautiques,* 1954, no. 1, p. 44-51.

Application to flat and flanged sheets. Materials and molding of templets. Cutting and punching tools. Photographs. (G17)

388-G. (German.) **Self-Excited Vibrations of Machine Tools.** J. Tlusty. *Acta Technica Academiae Scientiarum Hungaricae,* v. 8, nos. 3-4, 1954, p. 319-360.

Characteristic properties established by measurements and tests on all main types of machines. Photographs, graphs, diagrams. (G17)

389-G. (German.) **Belt or Wheel Grinding? III.** G. Pahlitzsch and H. Windisch. *Metalloberfläche,* Ausgabe A, v. 8, no. 6, June 1954, p. 87-92.

Advantages and disadvantages of both systems. Graphs. 18 ref. (G18)

390-G. (Russian.) **Modification of High-Alloy Cast Steels.** N. D. Tiuteva and V. T. Svishchenko. *Doklady Akademii Nauk SSSR,* v. 96, no. 1, May 1, 1954, p. 119-120.

Improved cutting properties with small additions of boron. Tables. 4 ref. (G17, TS)

391-G. Titanium Is Unorthodox When Machined. Here's Why. M. Eugene Merchant, E. J. Krabacher, H. W. Young and J. H. Miller. *American Machinist,* v. 98, July 5, 1954, p. 118-121.

Machining characteristics of titanium include better surface finish, lower forces and power consumption but shorter tool life than with steel. It has thinner, more irregular chips and definite shear planes. Photographs, graphs, diagram, micrographs. (G17, Ti)

392-G. Cope Talks on Draw Dies. XIV. Three Shell Jobs Typify Ironing Operations. Stanley R. Cope. *American Machinist,* v. 98, July 5, 1954, p. 126-128.

Application of dies. Rules for ironing speeds and permissible reductions. Photographs, diagrams. (G4, CN, Al)

393-G. Production Problems on Supersonic Planes. Anderson Ashburn. *American Machinist,* v. 98, July 5, 1954, p. 129-144.

Developments in machining, forming, extrusion, assembly and heat treatment of aluminum alloys. Photographs. (G general, J general, Al)

394-G. Reference Book Sheet. Reasons for Carbide-Tool Failure. IV.-VI. W. L. Kennicott. *American Machinist,* v. 98, July 5, 1954, p. 155-157, 159.

Examples of tool failures and how they were analyzed and corrected. Photographs. (G17, S21)

395-G. **Gear Shaving Insures Close Backlash Control.** William Newell. *Iron Age,* v. 174, July 8, 1954, p. 104-106.
Machining and inspection of close-tolerance gearing. Photographs. (G17, S general, CI, AY)

396-G. **Lockheed Uses Epoxy Resins for Various Kinds of Tooling.** G. J. Walkey. *Machinery,* v. 60, July 1954, p. 168-173.
Advantages and use of epoxy resins in punches, dies, stretch-form blocks, templates and work fixtures. Photographs. (G general)

397-G. **Fabricating High Temperature Metals Into Jet-Engine Afterburners.** Lawrence Limbach. *Machinery,* v. 60, July 1954, p. 174-181.
Manufacturing methods used by the Ryan Aeronautical Co. Welding, machining and heat-treating operations. Photographs. (G17, K general, J general, SG-h)

398-G. **North American's Present Hydroforming Practice.** Fred Koeller. *Machinery,* v. 60, July 1954, p. 190-195.
Equipment and methods, typical examples of work produced. Photographs, diagrams. (G8)

399-G. **New Metal-Shop Methods at Convair.** H. D. Cromartie. *Machinery,* v. 60, July 1954, p. 196-201.
Improved production methods in impact and hydraulic forming. Photographs. (G1)

400-G. **Precision Machining of Small Gas Turbines.** F. H. Minturn. *Machinery,* v. 60, July 1954, p. 212-217.
Techniques and tooling for close-tolerance machining of heat and corrosion resisting alloys. Photographs. (G17, SG-g, h)

401-G. **A Closer Look at Impact Extrusion.** Keith Wilhelm. *Product Engineering,* v. 25, July 1954, p. 129-133.
Advantages and sizes, tolerances and surface finish of extrusions. Photographs, diagrams, graph, table. (G5, Al, CN)

402-G. **Machining Advances Forced by New Landing Gear Needs.** G. E. Beringer. *SAE Journal,* v. 62, July 1954, p. 61-65.
Excerpts from paper "Manufacturing Requirements for Producing the Modern Landing Gear" presented at SAE National Aeronautic Meeting, Los Angeles, Oct. 1, 1953. Machining on a three-dimensional contour milling machine, machining of high-strength steels, automatic machining methods. Photographs, graph. (G17, AY)

403-G. **The Case for Cold Heading.** D. H. Samuelson. *Steel,* v. 135, July 12, 1954, p. 110-111.
Review of cold heading operations, costs and materials. Diagrams, photographs. (G10, CN, AY)

404-G. **Turret Change Speeds Setup.** E. A. McKee. *Steel,* v. 135, July 12, 1954, p. 146-147.
Instead of changing tools in turret lathes, a complete change is made—turrets and all. Result is shorter setup time and easier tool maintenance. Photographs. (G17)

405-G. **Cast Aluminum Plate; a Versatile Tooling Material.** Kirby F. Thornton. *Tooling and Production,* v. 20, July 1954, p. 46-48, 70, 133.
Application and fabrication of aluminum stretch-forming dies and inspection jigs and fixtures. Photographs, diagrams. (G9, G17, Al)

406-G. **Press Working the Aluminum Alloys. II.** Lester F. Spencer. *Tooling and Production,* v. 20, July 1954, p. 50-53, 128.
Detailed operational techniques for various types of forming and bending procedures. Photographs, tables. (G1, Al)

407-G. **High Speed Steel Saw Bands.** H. J. Chamberland. *Tooling and Production,* v. 20, July 1954, p. 85-142.
Use of improved semi-automatic machines results in increased production and lower costs in band machining. Tables. (G17, TS)

408-G. (Russian.) **Evaluation of Drawing Properties of Sheet Metal for Hollow Parts of Complex Form.** A. V. Altykis. *Vestnik Machinostroeniia,* v. 33, no. 12, Dec. 1953, p. 41-45.
Stress distribution and nature of failure in deep drawings made from various shapes of steel blanks. Diagrams, graphs, photographs. 2 ref. (G4, CN)

409-G. (Russian.) **Equation for the Cutting Force of High Speed Machining of Steel.** A. M. Rozenberg and L. A. Khvorostukhin. *Vestnik Mashinostroeniia,* v. 34, no. 1, Jan. 1954, p. 70-74.
Experimental verification of formula. Tables, graphs. 3 ref. (G17, TS)

410-G. (Russian.) **Problem of Chip Breaking.** V. A. Zemlianskii. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 77-82.
Method of calculating chip breaking process and criterion of its deformation which permits separation of curling and breaking zones. Diagrams, graphs, tables. 20 ref. (G17)

411-G. (Book.) **Cutting Speed Versus Tool Life When Shaping Titanium**

With High Speed Steel Tools. 21 p. U. S. Dept. of Commerce, PB 111299, Office of Technical Services, Washington 25, D. C. $1.00.

Results of tool-life tests on a shaper at constant cutting depth of 0.05 in. and feed rate of 0.01 in. per stroke. (G17, Ti)

412-G. (Book.) **Effect of Side Rake Angle on Tool Life in Turning Titanium.** 62 p. U. S. Dept. of Commerce, PB 111297, Office of Technical Services, Washington 25, D. C. $1.50.

Angles from −8 to 40°. (G17, Ti)

413-G. (Book.) **Effect of Size of Cut on Tool Life in Turning Titanium.** 56 p. U. S. Dept. of Commerce, PB 111298, Office of Technical Services, Washington 25, D. C. $1.25.

Tool-life curves for high-speed tools at various feed rates and cutting depths. (G17, Ti)

414-G. (Book.) **Forming and Bending Kaiser Aluminum.** Kaiser Aluminum & Chemical Sales Inc., 919 North Michigan Blvd., Chicago 11, Ill.

Forming with hydraulic and mechanical presses; tensile and compressive forming; spinning; bending with hand and power operated equipment. (G1, Al)

415-G. (Book.) **New Processes for Machining and Grinding.** 52 p. 1953. National Research Council, U. S. Dept. of Commerce, PB 111243, Office of Technical Services, Washington 25, D. C. $1.00.

Electro-sparking, electro-arcing, electrolytic, and ultrasonic abrasion processes. New developments in silicon carbide belt and wheel grinding and diamond wheel grinding. (G18)

416-G. (Book.) **Power Hacksaw Operations on Titanium and Its Alloys.** 33 p. U. S. Dept. of Commerce, PB 111300, Office of Technical Services, Washington 25, D. C. $1.00.

Results of tests with four pitch saws operating at three different speeds. Saw materials were tungsten and molybdenum high speed steel. (G17, Ti)

417-G. (Book.) **Preliminary Report on the "Cutting Characteristics of Titanium".** 30 p. U. S. Dept. of Commerce, PB 11295, Office of Technical Services, Washington 25, D. C. $1.00.

Machining test data on chip formation, microhardness, tool life, and cutting force. (G17, Ti)

418-G. (Book.) **Tool Life Versus Nose Radius When Turning Titanium.** 29 p. U. S. Dept. of Commerce, PB 111301, Office of Technical Services, Washington 25, D. C. $1.00.

Cutting speed; tool life tests with varying nose sizes. (G17, Ti)

419-G. (Book—German.) **Construction, Capabilities, and Industrial Utilization of Machine Tools.) Aufwand, Leistung und Wirtschaftlichkeit Neuzeitlicher Werkzeugmachinen.** 188 p. 1953. Verlag W. Girardet, Essen, Germany. DM 36.

Reduction of tool-wear temperature distribution at cutting edges, machining properties as related to structure, tool vibration, electrical controls, variable drives, and economic considerations. (G17)

420-G. **Machining Hard Materials.** J. Hinnüber and O. Rüdiger. *Aircraft Production,* v. 16, July 1954, p. 260-265. (Based on a translation of "New Methods of Metalworking, in Particular Electro-Erosion." Published by *Werkstatt und Betrieb,* v. 87, no. 2, 1954, p. 53-57.)

Review of chemical, electrical, and ultrasonic - vibratory techniques. Photographs, micrographs, table, graphs. 27 ref. (G17)

421-G. **Developments in Deep-Hole Boring. II. Small-Diameter D-Bit and Beisner-Head Boring.** H. J. Pearson. *Aircraft Production,* v. 16, July 1954, p. 278-287.

Feed control; chip forms; cutting oils. Equipment. Photographs, diagrams. (G17)

422-G. **How to Stretch-Form Aluminum.** J. M. Adle. *American Machinist,* v. 98, July 19, 1954, p. 133-140.

Forming machines; tooling; lubricants. Diagrams, photographs. (G9, Al)

423-G. **Flame Cutting With Electronic and Magnetic Tracers.** R. F. Heimkamp. *Canadian Metals,* v. 17, June 1954, p. 46 + 4 pages.

Equipment and operating procedures. Photographs. (G22)

424-G. **Machining Hard Metals With Electric Sparks.** *Engineer,* v. 198, July 2, 1954, p. 11-12.

Equipment and procedures of "Sparcatron" process. Diagrams, photographs. (G17)

425-G. **Investigations on Surface Finish of Steel Shafts.** A. S. T. Thomson, A. W. Scott, W. Ferguson, and G. V. Stabler. *Institution of Engineers & Shipbuilders in Scotland. Transactions,* v. 97, pt. 7, 1953-1954, p. 549-591.

Effect of wear of scraping tool and recording the surface finish produced by combinations of wet scraping, grinding, emery polishing, honing, and superfinishing, and the times required for the various processes. Diagrams, graphs, photographs, tables. (G18, G19, ST)

426-G. **Some Practical Aspects of Cutting Tool Nomenclature Arising From Recent Research.** D. F. Galloway. *Institution of Mechanical Engi-*

neers, Proceedings, v. 168, no. 1, 1954, p. 67-79 + 4 plates; disc., p. 79-88.

Nomenclature for the most commonly used types of tools is presented, together with typical examples of tool geometry, grinding methods, and inspection equipment. Tables, graphs, diagrams, photograph. (G17)

427-G. **Carbides Mill Structural Members at High Speeds.** Horace Frommelt. *Iron Age*, v. 174, July 15, 1954, p. 111-113.

Use of carbide cutters at high speed reduces cutting pressures and lowers production costs. Photographs. (G17)

428-G. **Powder Processes Solve Tough Metal Removal Problems. I.** R. S. Babcock. *Iron Age*, v. 174, July 22, 1954, p. 105-108.

Includes cutting, scarfing, gouging, lancing and washing of cast iron, high-temperature alloy steels, nickel and nickel alloys, copper and copper alloys, aluminum, reinforced concrete and firebrick. Photographs, tables, diagram. (To be continued.) (G22, CI, SS-h, Ni, Cu, Al)

429-G. **Progressive Dies Speed Output of Cup-Shaped Parts.** W. G. Patton. *Iron*, v. 174, July 22, 1954, p. 109-111.

Blanking, drawing, trimming, and flanging. Photographs. (G2, G4, CN)

430-G. **High Temperature Alloys: Air Force Machinability Report. IV.** *Iron Age*, v. 174, July 22, 1954, p. 112-114.

Life expectancy of tools used in milling, drilling, and turning. Tables, graphs. (G17, SG-h)

431-G. **Soluble Oils.** *Lubrication*, v. 40, July 1954, p. 85-92.

Manufacture and properties of cutting fluids. Preparation and service life of emulsions. (G21)

432-G. **Shot Peening and Other Surface Working Processes.** ASM Committee on Shot Peening. *Metal Progress*, v. 66, no. 1-A, July 15, 1954, p. 104-108.

Effects on fatigue strength. Photographs, tables, diagrams. 8 ref. (G23, Q7)

433-G. **Press Forming of Sheet Steel.** ASM Committee on Forming. *Metal Progress*, v. 66, no. 1-A, July 15, 1954, p. 134-140.

Cold forming of sheet steel in hydraulic or mechanical presses. Blanking, piercing, trimming, shaving, bending, forming, drawing, cold extrusion, and efficient utilization of sheet. Diagrams, table. (G general, CN)

434-G. **Machining of Steel and Cast Iron.** ASM Committee on Machining. *Metal Progress*, v. 66, no. 1-A, July 15, 1954, p. 141-151.

Chip formation; tool materials, angles, failure, and life; power requirements; cutting fluids; minimum cost; maximum production; dimensions of cut; selection of cutting speed; and general recommendations for planning production. Micrographs, photographs, diagrams, tables, graphs. 15 ref. (G17, CI, ST)

435-G. (French.) **Cutting Oils. Mechanical Tests.** H. L. Bingham. *Revue universelle des mines*, v. 10, ser. 9, no. 6, June 1954, p. 226-242.

Equipment and tests on drilling and lathe work. Photographs, diagrams, graphs. 6 ref. (G21)

436-G. (German.) **Turning Shafts With Cemented Carbide Cutting Tools.** Anton Mackert. *Stahl und Eisen*, v. 74, no. 14, July 1, 1954, p. 869-873.

Effects of type of metal and cutting conditions on efficiency. Diagrams, tables. 3 ref. (G17)

437-G. (German.) **The Economic Production of Cold-Drawn Cross-Sections of Special Forms With Consideration of Rough Hot-Rolled Cross Sections for Small and Average Orders.** Karl Wenderlich. *Stahl und Eisen*, v. 74, no. 14, July 1, 1954, p. 876-880.

Economical method of filling relatively small orders for special steel shapes. Tables, diagrams. (G4, ST)

438-G. (Russian.) **Ultrasonic Method of Perforating Hard Materials.** M. M. Pisarevskii. *Stanki i Instrument*, v. 25, no. 5, May 5, 1954, p. 16-20.

Equipment and principles of ultrasonic drilling. Diagrams, tables. (G17)

439-G. (Russian.) **Problem of Cutting Forces During Broaching.** P. G. Katsev. *Vestnik Mashinostroeniia*, v. 34, no. 6, June 1954, p. 44-46.

Pressure calculations at various stages of process. Diagram, tables, graphs. (G17, ST)

440-G. **Cope Talks on Draw Dies. XV. Necked Shells Require Careful Reduction.** Stanley R. Cope. *American Machinist*, v. 98, July 19, 1954, p. 130-132.

Precautions and dies for production of necked shells. Diagrams. (To be continued.) (G4)

441-G. **Booth Ventilation for Swing Frame Grinders.** W. D. Bamford. *British Cast Iron Research Association, Journal of Research and Development*, v. 5, June 1954, p. 331-364 + 2 plates.

Practical application in design. Tables, diagrams, photographs. (G18)

442-G. The Grinding of Steel. XVIII. Lapping. XIX. Superfinishing. *Edgar Allen News,* v. 33, July 1954, p. 159-160.

Includes diagram. (To be continued.) (G19)

443-G. Hobbing at High Cutting Speeds. H. A. Koop. *Engineers' Digest,* v. 15, July 1954, p. 287-288. (Translated from *Werkstattstechnik und Maschinenbau,* v. 44, no. 4, Apr. 1954, p. 155-157.)

Influence of cutting speed and rate of feed on tool life. Graphs, diagram. (G17)

444-G. Add Iron Powder to Flame to Improve Cutting of Stainless Steels. J. R. Kirwin and J. Holmstock. *Industry & Welding,* v. 27, Aug. 1954, p. 70 + 3 pages.

Improved cutting methods permit application to thicknesses in excess of 4 in. Photographs. (G22, SS)

445-G. The Selection and Use of Cutting Oils. *Mechanical World and Engineering Record,* v. 134, July 1954, p. 294-296.

Desirable characteristics, types and applications result in reduced machining costs. Photographs. (G21, G17)

446-G. Selection and Use of Honing Abrasives. *Metal-Working,* v. 10, Aug. 1954, p. 14-15.

Conditions that may be changed to improve honing. Recommended stones for specific applications. Tables. (G19, ST)

447-G. Trouble-Shooting in the Press Room. II. How to Avoid Return of Slugs Above the Die-Plate. Federico Strasser. *Modern Industrial Press,* v. 16, July 1954, p. 54-55.

Causes of returning of slugs and blanks into the space between die plate and stripper. Remedies. (G1)

448-G. The Forming of Aluminium Sheet. VI. Rubber-Die Pressing. H. Hinxman. *Sheet Metal Industries,* v. 31, no. 327, July 1954, p. 557-561, 573.

Description of presses, methods of minimizing wear of rubber pads, devices for increasing pressing pressure and pressing techniques. Photographs, diagrams. (To be continued.) (G8, Al)

449-G. Electrospark Machining. C. Paul Porterfield. *Steel Processing,* v. 40, July 1954, p. 443-446.

Contact, electrolytic and spark-initiated discharge methods. Diagrams, photograph. 6 ref. (G17)

450-G. Hard Bronze Draws Stainless Without Scratches. Arnold Walz. *American Machinst,* v. 98, Aug. 2, 1954, p. 106-109.

New alloy produces better results. Performance and special problems. Photographs, diagrams. (G4, Cu, SS)

451-G. Take Your Pick of a Million Grinding Wheels. Norman P. Robie. *American Machinist,* v. 98, Aug. 2, 1954, p. 114-116.

Factors in proper selection of abrasive. Photographs, tables. (G18)

452-G. Mist Cooling Goes to Work. I. Mist-Cooling Systems Improve Machining Operations. Richard F. Thuma and Jesse G. Sdano. **II. Mist Cooling Helps Some Planer Jobs.** W. G. Feuerpfeil, R. M. Titus and W. C. Thuerwachter. *American Machinist,* v. 98, Aug. 2, 1954, p. 117-132.

Advantages in working conditions, maintenance and safety. Increased tool life and better finish. Photographs, diagram. (G17, G21, ST)

453-G. Cope Talks on Draw Dies. XVI. Make Offsets in Dies or on Lathes. Stanley R. Cope. *American Machinist,* v. 98, Aug. 2, 1954, p. 134-136.

Several methods and their applications. Diagrams. (To be continued.) (G4)

454-G. New CO_2 Concept Machines Tough Alloys. George H. DeGroat. *American Machinist,* v. 98, Aug. 2, 1954, p. 152-154.

Original metallurgical properties maintained during cutting. Process and demonstrations described. Photographs, micrographs. (G17, G21, AY)

455-G. Machining Titanium. G. G. M. Carr-Harris. *Canadian National Research Council, Technical Information Service Report no.* 41, July 1954, 12 p.

Tool life, feed rates, drilling, reaming and other machining operations. 101 ref. (G17, Ti)

456-G. How to Machine Stainless Steels. I. Lester F. Spencer. *Modern Machine Shop,* v. 27, Aug. 1954, p. 97-109.

Stainless steel characteristics, equipment and tool materials, operational procedures and typical work jobs. Tables, photographs, diagrams. (To be continued.) (G17, SS)

457-G. Step Up Efficiency in Carbide Grinding. F. J. Lennon. *Steel,* v. 135, Aug. 9, 1954, p. 92-93.

Examines and evaluates various processes. Photographs, table, graph. (G18)

458-G. Design of Steel Parts for Cold Extrusion. D. I. Brown. *Tool*

Engineer, v. 33, Aug. 1954, p. 63-65.

Contributes to cost reduction and increases basic design possibilities. Case histories and design problems. Diagrams. (G5, ST)

459-G. Thin-Walled Extrusion on the Drill Press. W. N. Parker. *Tool Engineer,* v. 33, Aug. 1954, p. 79-80.

Description and applications of the Uniskan extrusion method. Photographs, diagrams. (G5)

460-G. (German.) **Grinding of Slabs and Billets of High-Grade Steel Before Finish Rolling.** Robert Sachers. *Metalloberfläche,* Ausgabe A, v. 8, no. 7, July 1954, p. 103-104.

Evaluations of improved methods of detecting and eliminating surface defects. (G18, F21, ST)

461-G. (Russian.) **Means of Increasing the Efficiency of Metal Finishing.** S. M. Kedrov. *Stanki i Instrument,* v. 25, no. 6, June 1954, p. 1-7.

Abrasive lapping and polishing. Lubricants. Effect of abrasive grain size and surface active agents. Diagrams, graphs, table. (G19, CI, ST)

462-G. (Russian.) **Problem of Determining Force of Cold Heading.** G. A. Navrotskii. *Vestnik Mashinostroeniia,* v. 34, no. 7, July 1954, p. 30-34.

Testing devices and presses. Resistance to deformation. Table, graphs, diagram, photograph, 4 ref. (G10, ST, Cu)

463-G. (Russian.) **Work Hardening and Residual Stresses During Reaming of Construction Steels.** P. E. D'iachenko and N. A. Podosenova. *Vestnik Mashinostroeniia,* v. 34, no. 7, July 1954, p. 45-47.

Cutting speeds and surface quality of part being machined. Optimum radius of curvature of cutting tools. Graphs. (G17, ST)

464-G. (Russian.) **New Scale Pattern Device for Flame Cutting.** I. A. Antonov, Iu. V. Kurlovich and D. Ia. Shukhman. *Vestnik Mashinostroeniia,* v. 34, no. 5, May 1954, p. 78-80.

Series cutting of large objects by means of small-scaled patterns. Photographs. (G22, CN)

465-G. (Book.) **Deep Drawing.** J. Willis. Butterworths Scientific Publications, 88 Kingsway, London, W.C.2., England. 25s.

Engineering aspects. Equipment; theory; techniques. (G4)

466-G. (Book.) **Metalworking Tomorrow.** George F. Doriot. 136 p. Harvard Graduate School of Business Administration, Cambridge, Mass. $10.00.

Continuous casting, shell molding, investment casting, powder metallurgy, cold and hot extrusion, heavy press program, formdrawing, electromachining, electrolytic grinding and ultrasonic machining processes. (G general, E general, H general, F24)

467-G. (Book.) **Practical Sheet and Plate Metal Work.** Arthur Atkins. 6th Ed. 508 p. 1954. Sir Isaac Pitman & Sons, Ltd., Parker St. Kingsway, London, W.C.2. 20/—.

Reference book for those engaged in sheet metal work. (G general)

468-G. (Book.) **Proceedings of the Symposium on Machining and Grinding of Titanium.** Report no. PB 111375. 167 p. 1953. U. S. Department of Commerce, Room 6227, Commerce Building, Washington 25, D.C. $2.50.

Machining of titanium, internal and external grinding of titanium and its alloys, temperatures during machining, titanium alloy powders, and chip formation. (G17, G18, Ti)

469-G. Chip-Control. L. Fine. *Aircraft Production,* v. 16, Aug. 1954, p. 296-300.

Methods for machining with carbide-tipped tools. Photograph, diagrams, table. 4 ref. (G17)

470-G. Developments in Deep-Hole Boring. III. Rotating-Bar and Stationary-Bar Boring; Determining Cutter-Head Performance: Trepan-Boring Head Design and Performance. H. J. Pearson. *Aircraft Production,* v. 16, Aug. 1954, p. 326-336.

Machining tests, tool planforms, cutting fluids and coolants. Photographs, graphs, tables. (G17, G21, SS, ST)

471-G. Electric Spark Machining. *Automobile Engineer,* v. 44, July 1954, p. 295-297.

Sparcatron process for working hard materials. Photographs. (G17)

472-G. Titanium Fasteners Study. Harry S. Brenner. *Light Metal Age,* v. 12, Aug. 1954, p. 10-11, 30.

Production and evaluation of bolts. Heading and machining operations. Graph, photograph. (G10, G17, T7, Ti)

473-G. Chemical Milling. New Process for Etching Aluminum. *Light Metal Age,* v. 12, Aug. 1954, p. 20-21, 35.

Advantages and techniques of forming method. Photographs, diagrams. (G17, Al)

474-G. Troubles Encountered With Tools Most Commonly Used in Cutting Stainless Steel. *Machine and Tool Blue Book,* v. 49, June 1954, p. 193, 195-196, 198.

Reference sheets giving tool troubles and remedies. (G17, SS)

475-G. Automatic Controls for Indexing Operations. Floor-to-Floor Time Reduced 10-20%. Walton Rainey. *Machine and Tool Blue Book,* v. 49, June 1954, p. 213-218.

Servo-system for positioning turrets on punch press. Photograph, diagram. (G2)

476-G. Planning Machine Series. II. Paolo Tedeschi. *Machine Design,* v. 26, Aug. 1954, p. 163-174.

Theory and application of analytical techniques for series planning. Tables, graphs. 1 ref. (To be continued.) (G17, S12)

477-G. Unit Engineering of Multiple Drilling and Tapping Equipment. Melvin H. Emrick. *Machinery,* v. 60, Aug. 1954, p. 165-168.

Standardization of multiple-head components, chucks and fixture design account for success of method. Photographs. (G17)

478-G. Central Coolant Supply Serviced by Coarse-Screen Filter. John W. Fauver. *Machinery,* v. 60, Aug. 1954, p. 169-171.

Provides a more consistent product finish, decrease in replacement costs and reduction in man-hours previously allotted to cleaning out machine sumps. Photographs. (G21)

479-G. Soluble Oil Cutting Fluids. R. K. Gould. *Machinery,* v. 60, Aug. 1954, p. 186-189.

Stable emulsion formed when mixed with water provides variety of cooling and lubricating properties by changing oil-water ratio. (G21)

480-G. Experience Accumulates on Drawing Titanium. Carter C. Higgins. *Machinery,* v. 60, Aug. 1954, p. 193-195.

Commercially pure titanium can be successfully drawn at room temperatures. Photographs. (G4, Ti)

481-G. Magnetic Tape Control of Machine Tools. C. K. Marklew. *Machinery Lloyd (Overseas Ed.),* v. 26, July 17, 1954, p. 70-76.

Automatic control over dimensions and function. Theory and application. Photographs, diagrams. (G17)

482-G. Automatic Control of Machine Tools. D. T. N. Williamson. *Machinery Lloyd (Overseas Ed.),* v. 26, July 17, 1954, p. 77-83.

Method of reducing machine functions to coded data by digital computers. Diagrams. (G17)

483-G. Alumina-Tipped Cutters. (Digest of "Ceramic-Tipped Cutting Tools," by K. J. B. Wolfe; 5th International Mechanical Engineering Congress, 1953). *Metal Progress,* v. 66, Aug. 1954, p. 143-144.

Properties and case histories of use. (G17)

484-G. The Forming of Aluminium Sheet. VII. Stretch-Forming. H. Hinxman. *Sheet Metal Industries,* v. 31, no. 328, Aug. 1954, p. 673-678.

Equipment and techniques. Photographs, diagrams. (To be continued.) (G9, Al)

485-G. (French.) **Reflections on the "Drawability" of Sheet Metal. III.** Pierre Vauthier. *Métaux, Corrosion-Industries,* v. 29, no. 346, June 1954, p. 242-258.

Deformation imposed by advance of die, autonomous field of residual internal stresses, breaking load, preferential orientations. Graphs, diagrams, tables. (G4, Q25)

486-G. (French.) **Contribution to the Study of Oxy-Acetylene Cutting.** Jean-Marie Morelle. *Revue de la Soudure* (Brussels), v. 10, no. 2, 1954, p. 105-118.

Effects of cracks, slag, oxygen flow, temperature, pressure and composition of metal. Tables, photograph, graphs, diagrams. (G22)

487-G. Machining Characteristics of Cast Irons. Michael Field and John F. Kahles. *American Foundrymen's Society, Preprint no.* 54-73, 1954, 6 p.

Effect of microstructure on cutting characteristics. Micrographs, tables, diagram, graphs. (G17, M27, CI)

488-G. Cope Talks on Draw Dies. XVII. Choose From 4 Methods to Bulge Shells. Stanley R. Cope. *American Machinist,* v. 98, Aug. 16, 1954, p. 122-125.

Design of bulging dies. Rules for calculating the shell. Diagrams. (To be continued.) (G14)

489-G. Evaluation of Bandsaw Performance. L. V. Colwell and R. E. McKee. *ASME, Transactions,* v. 76, Aug. 1954, p. 951-959; disc. p. 959-960.

Test conditions and procedure, tool life, cutting forces. Graphs, tables, photographs, diagrams. (G17, ST, Ti)

490-G. Cutting With Single Point Tools. John Wragg. *Edgar Allen News,* v. 33, Aug. 1954, p. 169-172.

Tool selection, grinding and wear. Coolants. Graph, photograph, micrograph. (G17, G18, G21)

491-G. The Grinding of Steel. XIX. Superfinishing. *Edgar Allen News,* v. 33, Aug. 1954, p. 181-182.

Types of abrasives and their use. Graph, table. (To be continued.) (G18, G19, ST)

492-G. Future Transistor Applications in Machine-Tool Control. R. L. Bright. *Instruments and Automation,* v. 27, Aug. 1954, p. 1296-1298.
High sensitivity of phototransistors can open new fields in machine tool control. Diagrams, graph. (G17)

493-G. Trepanning Cuts Hole Making Costs. A. G. Haglund. *Iron Age,* v. 174, Aug. 12, 1954, p. 120-121.
Examples of trepanning efficiency. Photographs. (G17)

494-G. Powder Processes Solve Tough Metal Removal Problems. III. R. S. Babcock. *Iron Age,* v. 174, Aug. 12, 1954, p. 122-124.
Introduction of iron powder into the reaction zone of an oxy-acetylene flame speeds metal removal. Powder washing and lancing. Diagram, photographs. (G22)

495-G. Cold Hobbing of Mould and Die Cavities. *Machinery (London),* v. 85, Aug. 6, 1954, p. 263-271.
Methods, applications and advantages. Photographs. (G17, ST)

496-G. Some Examples of Metal Spinnings. *Machinery (London),* v. 85, Aug. 6, 1954, p. 275-279.
Applications and advantages of process. Photographs. (G13)

497-G. Lubrication in the Cutting of Metals. Antoni Niedzwiedzki. *Machinery (London),* v. 85, Aug. 6, 1954, p. 280-286.
Selection of cutting fluids on basis of cutting conditions and type of machining or grinding operation to be performed. Tables. 12 ref. (G21, G17, G18)

498-G. Spark Machining. *Mechanical World and Engineering Record,* v. 134, Aug. 1954, p. 352-356.
Equipment and operating procedures. Photographs, diagrams. (G17)

499-G. Cutting Tools and Lubricants. *Mechanical World and Engineering Record,* v. 134, Aug. 1954, p. 374-376.
Basic relationships between tool, material and cutting fluid. Diagrams, tables. (G17, G21)

500-G. Mechanics of Tool Engineering. IV. Tooling the Milling Machine. Andrew E. Rylander. *Western Machinery and Steel World,* v. 45, Aug. 1954, p. 77-80.
Use of auxiliary tooling and vacuum chucks. Photographs, diagrams. (G17)

501-G. Titanium: Machining Recommendations. L. O. Montgomery. *Western Machinery and Steel World,* v. 45, Aug. 1954, p. 81-83.
Tools, milling, drilling, tapping, grinding, sawing and reaming. Tables, photograph. (G17, G18, Ti)

502-G. Torch Cutting Titanium Before Machining Speeds Operation, Gives Good Results. C. W. Snyder and F. D. Wallace. *Western Metals,* v. 12, Aug. 1954, p. 54-56.
Materials savings made by torch cutting prior to machining. Favorable results obtained with right methods, heavy equipment properly manned. Photographs. (G22, G17, Ti)

503-G. Electrosparking Process for Grinding Carbide-Tipped Profile Cutters. F. F. Cherepanov. *Henry Brutcher, Altadena, Calif., Translation no.* 3040, 4 p. (From *Stanki i Instrument,* v. 23, no. 4, 1952, p. 31-32.)
Reduction of grinding time and elimination of cracking and chipping due to grinding. Optimum conditions for maximum production. Table, diagrams. (G18, C-n)

504-G. (Japanese.) **Improvements in Impact Extrusion Methods.** *Metals (Japanese),* v. 24, no. 7, July 1954, p. 513-519.
Deformations and work hardening during forming of cups in various metals. Photographs, graphs, diagrams. (G5, AY, Cu, Al)

505-G. (Russian.) **Mechanism of Action of Active Media During Machining of Metals.** G. I. Epifanov, N. A. Pleteneva, and P. A. Rebinder. *Doklady Akademii Nauk SSSR,* v. 97, no. 2, July 11, 1954, p. 277-279.
Changes in metal microstructure and properties caused by absorption of materials from cutting fluids. 13 ref. (G17, M27)

506-G. Work Cuts Tool, Tool Forms Work With Ultrasonics. E. J. Tangerman. *American Machinist,* v. 98, Aug. 30, 1954, p. 85-88.
Ultrasonic machining of carbide-type rolling dies. Photographs. (G17)

507-G. Trepanning Titanium Saves Time and Material. S. E. Siemen and Nicholas Rosato. *American Machinist,* v. 98, Aug. 30, 1954, p. 89-91.
Large cylinders of titanium alloy can be produced by trepanning from solid billets, salvaging the core from the hole by substituting rollers for wear plates, and changing the method of oil supply. Photographs. (G17, Ti)

508-G. Conventional Tools Machine Titanium. Roland Satterlee. *American Machinist,* v. 98, Aug. 30, 1954, p. 94-97.
Typical operations in producing an aircraft-gun part. Carbide tools, drilling and lathe operations. Photographs, diagrams. (G17, Ti)

509-G. Cope Talks on Draw Dies. XVIII. Fluid Dies Bulge Shells and

Form Ornamental Designs. Stanley R. Cope. *American Machinist,* v. 98, Aug. 30, 1954, p. 109-112.

Design and operation of bulging dies. Diagrams. (To be continued.) (G14)

510-G. **Milling Operations With Carbide Tipped Cutters.** P. J. W. Cottrell. *Machinery (London),* v. 85, Aug. 13, 1954, p. 339-346.

Tool angles, failures, economics and examples of various operations. Graphs, diagrams. (G17)

511-G. **Hi-Jet System of Cutting Oil Application.** *Machinery (London),* v. 85, Aug. 20, 1954, p. 390-391.

Tool life improved when applied to turning steel. Diagram. (G21)

512-G. **Metal Working Swings to Plastics Tools.** *Modern Plastics,* v. 32, Sept. 1954, p. 85-95, 218-219.

Press forming and stretch forming with laminated plastic dies. Photographs. (G1, G9)

513-G. **Mechanical Testing of Cutting Fluids.** H. L. Bingham. *Scientific Lubrication,* v. 6, Aug. 1954, p. 22-24.

Tests for drilling and turning; difficulties involved. Graphs. (G21)

514-G. **Practical Cutting Speed. It's Faster Than You Think.** R. F. Huber. *Steel,* v. 135, Aug. 30, 1954, p. 64-66.

High cutting rates work out in production. Economics fix practical point in its application and potential. Photographs, table, graph, micrographs. (G17, ST)

515-G. **Deep Draw Titanium in One Operation.** *Steel,* v. 135, Aug. 30, 1954, p. 80.

New possibilities for design and use of titanium result from elimination of multiple draws. Photographs. (G4, Ti)

516-G. **Tool Control for Multiple-Spindle Machines.** Harry Conn. *Tool Engineer,* v. 33, Sept. 1954, p. 69-71.

Tooling factors for transfer and other types of multiple-spindle machines. Photographs, diagrams. (G17)

517-G. **Cold Extrusion Primed for Mass Production.** Ralph H. Eshelman. *Tool Engineer,* v. 33, Sept. 1954, p. 77-86.

Forward and backward extrusion, equipment, materials and future trends. Photographs, diagrams, graphs, tables. (G5)

518-G. (Dutch.) **Cutting.** *Metalen,* v. 9; *Handel en Industrie,* v. 9, no. 14, July 31, 1954, p. 125-128.

Cutting techniques and special features of Swiss machines. Photographs, diagrams. (To be continued.) (G17)

519-G. (French.) **Shot-Peening in the Machine Industry.** Alberto Oreffice. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 291, 293-294, 297.

Possibilities and use in production of springs and other parts. Photographs, tables, diagrams. (G23, ST)

520-G. (German.) **Bending Semifinished Products of Aluminum and Its Alloys.** *Aluminium Ranshofen, Mitteilungen,* v. 2, no. 1, June 1954, p. 7-13.

Methods of bending sheets, tubes and profiles. Diagrams, tables. (G6, Al)

521-G. (German.) **The Surface of Semifinished Aluminum Parts.** *Aluminium Ranshofen, Mitteilungen,* v. 2, no. 1, June 1954, p. 18-20.

Effect of mechanical, chemical and electrolytic machining methods on surface properties. (G17, L12, L13, Al)

522-G. (German.) **Band Grinding or Disk Grinding? IV.** G. Pahlitzsch and H. Windisch. *Metalloberfläche,* Ausgabe A, v. 8, no. 8, Aug. 1954, p. 119-125.

Experimental results on effects of different lubricants and coolants. Graphs. 8 ref. (G18, G21)

523-G. (Russian.) **Effect of Mechanical Properties of Metals on Occurrence of Vibrations During Machining.** B. G. Kelendzheridze *Stanki i Instrument,* v. 25, no. 7, July 1954, p. 15-16.

Effects of hardness, tensile strength, elongation and other properties on cutting speed. Graphs, table. 4 ref. (G17, Q29, Q23, ST, Al, Cu, CI)

524-G. (Russian.) **Means of Increasing Efficiency of Metals Finishing.** S. M. Kedrov. *Stanki i Instrument,* v. 25, no. 7, July 1954, p. 17-20.

Quantity and types of abrasives and lubricants. Lap materials and operations. Graphs, micrographs. (G18, CI, ST, Cu, Al)

525-G. (Russian.) **Influence of Machining Conditions on the Quality of Finish of the Surface of Chromium-Plated Parts During Polishing With Wheels.** A. A. Mikhailov. *Stanki i Instrument,* v. 25, no. 7, July 1954, p. 21-23.

Effect of grinding wheel type, feed and speed. Graphs, tables. 3 ref. (G18, ST, Cr)

526-G. (Book—French.) **Professional Technological Course.** v. III. 121 p. La Société de Publications Mécaniques, 15 rue Bleue, Paris 9e, France. 500 f. Post free 550 f.

Various types of machine tools

and their applications. Basic information on machining processes. (G17)

527-G. New Techniques for Titanium. Ralph A. Haver and David S. Adams. *Aero Digest,* v. 69, Sept. 1954, p. 42, 46, 48.

Fabrication methods including riveting, drilling, cutting, forming, and welding. Photographs, table. (G general, K general, Ti)

528-G. Shop Hints Help Form and Mill Titanium. *American Machinist,* v. 98, Sept. 13, 1954, p. 129-133.

Presentation of data pertinent to designing and planning for production. Diagrams, photographs. (G general, Ti)

529-G. Cope Talks on Draw Dies. XIX. Stampings Often Require Burred or Flanged Holes. Stanley R. Cope. *American Machinist,* v. 98, Sept. 13, 1954, p. 140-143.

Analysis of several kinds of burrs, their formulas and maximum proportions. The beginning of a series of dies to make them. Diagrams. (G3)

530-G. Ti-Stainless Machined Like Butter. George Glaeser. *American Machinist,* v. 98, Sept. 13, 1954, p. 144.

Key to good tool life, surface finishing and production accomplished by proper coolant. Photographs, diagram. (G17, G21, Ti)

531-G. How to Calculate Exact Wheel Profiles for Form Grinding Helical-Gear Teeth. Oliver Saari. *American Machinist,* v. 98, Sept. 13, 1954, p. 172-175.

Derivation of formulas for computing coordinates, pressure angle and radius of curvature of cutter form, and use of computed data in establishing the settings of the radius-dressing fixture. Diagrams, table. 3 ref. (G18)

532-G. Developments in the Sparcatron Spark-Machining Process. *Machinery (London),* v. 85, Sept. 3, 1954, p. 488-492.

Principles, equipment and applications. Photographs. (G17)

533-G. Flow-Form Dimpling Operations. Gilbert C. Close. *Machinery (London),* v. 85, Sept. 3, 1954, p. 499-501.

Equipment and procedures. Diagrams, photograph. (G2)

534-G. The Importance of Applied Science in the Machining of Metals. Edward Bruin. *Canadian Metals,* v 17, Sept. 1954, p. 44, 46, 48, 50.

Principles of chip formation, cutting fluids, cutting conditions and "secondary" phenomena. (G17, G21)

535-G. Learning Metalwork With Aluminium. I. John C. Older. *Light Metals,* v. 17, Sept. 1954, p. 302-303.

Materials and tools for fabricating sheet aluminum. Diagrams. (G general, Al)

536-G. Turning Titanium Jet Compressor Discs. John L. Elliott. *Machine and Tool Blue Book,* v. 49, Sept. 1954, p. 159 + 6 pages.

Tooling, machining and problems. Photographs. (G17, Ti)

537-G. Bolt Cold-Heading and Inspection at International Harvester. J. P. Lehning. *Machinery,* v. 61, Sept. 1954, p. 171-173.

Automatic boltmakers and accessory equipment. Inspection by magnetic particle method. Photographs. (G10, S13, CN)

538-G. Brass Wheels Grind Carbides. Arthur A. Merry and Leslie F. Wheeler. *Machinery,* v. 61, Sept. 1954, p. 174-177.

Grinding by high-frequency arc discharge. Photographs. (G18, Cu, C-n)

539-G. Low-Cost Press Tools for Moderate Production Requirements. G. C. Matson. *Machinery,* v. 61, Sept. 1954, p. 196-197.

Design and manufacture of low-cost, semihard dies. Photographs, diagram. (G1, TS)

540-G. Machining Titanium. *Metal Industry,* v. 85, Aug. 13, 1954, p. 127-128.

Cutting lubricants, turning, drilling, tapping, milling, and sawing. Table, diagram. (G17, G21, Ti)

541-G. Steel Cartridge Cases. (Digest of "Steel Cartridge Cases", by William N. King; *Ordnance,* July-Aug. 1954, p. 49.) *Metal Progress,* v. 66, Sept. 1954, p. 198, 200.

Twin Cities Arsenal makes 45-caliber cases of steel or brass at same rate. See item 543-G, below. (G4, T2, ST)

542-G. Carbide Tooling for Multiple Spindle Bar Automatics. Fred W. Vogel. *Modern Machine Shop,* v. 27, Sept. 1954, p. 144-150.

Application of cemented carbides to automatic machines. Photographs, diagrams. (G17, T7, C-n)

543-G. Steel Cartridge Cases. William N. King. *Ordnance,* v. 39, July-Aug. 1954, p. 49-52.

Engineering techniques and facilities meet and solve problems of manufacturing steel cartridge cases for small-arms ammunition. Photographs. (G4, T2, ST)

544-G. Types of Steel, Microstructure, Chemical Composition, Tool Com-

patibility—How They Affect Machinability. *SAE Journal,* v. 62, Sept. 1954, p. 47-53.

Principles of machinability based on strength, hardness, ductility and microstructure aid in selecting steels for end product. Micrographs, table, diagram. 14 ref.
(G17, M27, Q23, ST)

545-G. **The Design of Simple Dies for Bending Operations.** W. M. Halliday. *Sheet Metal Industries,* v. 31, no. 329, Sept. 1954, p. 729-732.

Factors to be considered in dies for precision parts. Diagrams. (G6)

546-G. **Contour Forming.** L. F. Spencer. *Steel Processing,* v. 40, Sept. 1954, p. 579-584.

Equipment, applications and advantages of stretch and compression forming. Photographs. (G9)

547-G. **How to Increase Production.** Warren Turner and Paul Gruber. *Tooling and Production,* v. 20, Sept. 1954, p. 44-49.

Use of automatic cycles, power-operated fixtures, transfer mechanisms and loading devices in machining operations. Photographs, diagrams. (G17)

548-G. **Materials Handling at the Press.** E. V. Crane. *Tooling and Production,* v. 20, Sept. 1954, p. 51-55.

Automatic feeding and multiple-operation tooling for stamping operations. Photographs. (G3)

549-G. **Radial Forming Technique for Fabricating Sheet Metal Parts.** *Welding and Metal Fabrication,* v. 22, Aug. 1954, p. 286-287.

Principal feature includes world's largest expanding mandrel which permits precision forming of large contoured closed sections to exact dimensions. Photographs. (G1)

550-G. (Dutch.) **Cutting.** *Metalen,* v. 9; *Handel en Industrie,* v. 9, no. 15, Aug. 15, 1954, p. 130-134.

Cleaning and polishing of cast pieces, machining of large parts. Various cutting machines and their operation. Photographs. (G17, L10)

551-G. (Russian.) **Effect of Composition of Interelectrode Medium on Deterioration of Disk-Cathode and Efficiency of Electric-Spark Machining of Metals.** V. K. Nevezhin. *Elektrichestvo,* 1954, no. 8, Aug., p. 52-57.

Additives to electrolyte to lower rate of deterioration. Factors effecting efficiency. Tables, graphs, diagram. 5 ref. (G17)

552-G. **How to Work Stainless Steel.** Richard E. Paret. *American Machinist,* v. 98, Sept. 27, 1954, p. 129-140.

Fabricating characteristics of 31 standard grades. Tables, photographs. (G general, SS)

553-G. **The Influence of Chemical Composition on the Machinability of Rephosphorized Open Hearth Screw Steel.** E. J. Paliwoda. *American Sociey for Metals, Transactions,* v. 47, *Preprint No.* 10, 1954, 12 p.

Tests on effects of carbon, silicon, sulfur, manganese, phosphorus and nitrogen show that carbon, silicon and sulfur contents are most critical and require strict control. Photographs, tables, graphs, micrographs. 12 ref. (G17, CN)

554-G. **Colloidal Molybdenum Disulphide.** F. Gordon Kay. *Automobile Engineer,* v. 44, Sept. 1954, p. 357-358.

Development and applications as a lubricant on dies, molds, press and cutting tools. Test data. Table. (G21, F1)

555-G. **Ultrasonic Machining.** *Machinery Lloyd (Overseas Ed.),* v. 26, Sept. 11, 1954, p. 87-90.

Principle and versatility of instrument which drills holes of complex shapes in ceramics, tungsten and titanium carbides. Photographs, diagrams. (G17)

556-G. **Which Method for Deep Drawing Titanium.** Ralph G. Gillespie and J. Walter Gulliksen. *Materials & Methods,* v. 40, Sept. 1954, p. 98-101.

Advantages of hot and cold forming. Photographs. (G4, Ti)

557-G. **Relating Feed to Speed in Metal Cutting.** *Metal-Working,* v. 10, Oct. 1954, p. 16-17.

Limiting factors in general cutting and cutting with small drills. Graphs. (G17)

558-G. **Selecting the Best Method for Cutting Standard Steel Shapes.** *Meal-Working,* v. 10, Oct. 1954, p. 18-19.

Guide to shop cutting problems. Reference chart. (G17, ST)

559-G. **The Arc-Air Process.** M. D. Stepath. *Welding Journal,* v. 33, Sept. 1954, p. 860-864.

Description and operation of metal cutting process. Photographs, graph, tables. (G22)

560-G. (Book.) **Drilled Holes for Tapping. A Guide to the Correct Selection of Tap Drills.** 24 p. 1954. Metal Cutting Tool Institute, 405 Lexington Avenue, New York 17, N. Y.

Factors to be considered in drilling and tapping operations. (G17)

561-G. **How Rohr Heats Dies to Form Titanium.** J. E. Rheim. *Amer-*

ican Machinist, v. 98, Oct. 11, 1954, p. 161-163.

Liquid-media, electric cartridge and resistance heaters for dies to form aircraft engine mountings. Photographs. (G1, Ti)

562-G. The Grinding of Steel. XIX. Superfinishing. XX. Measurement of Surface Finish. *Edgar Allen News,* v. 33, Sept. 1954, p. 207-208.

Type of abrasive, procedure and special machinery used in finishing, surface measurement by optical, light and stylus methods. Photograph. (To be continued.) (G18, S14, ST)

563-G. Recording of Transient Phenomena in Machine Tools. S. Amari. *Engineers' Digest,* v. 15, Sept. 1954, p. 363-365, 368. (From *Macchine,* v. 9, no. 5, May 1954, p. 467-473.)

New method of point-by-point recording requires little equipment and gives direct recordings on paper. Photographs, diagram. (G17)

564-G. Some Aspects of Spark Machining. M. G. Seed and H. Drubba. *Engineers' Digest,* v. 15, Sept. 1954, p. 378-380.

Principle, applications and electrical aspects. Graphs, photograph, diagram, circuit. (G17, C-n)

565-G. Effect of Truing Conditions on Circular Grinding. G. Pahlitzsch and J. Appun. *Industrial Diamond Review,* v. 14, Sept. 1954, p. 185-189.

Effect of dressing variables on wheel roughness. Micrographs, diagrams, graph. (To be continued.) (G18)

566-G. How Ryan Forms Titanium. Frank Charity. *Machine and Tool Blue Book,* v. 49, Oct. 1954, p. 228-230, 232.

Commercially pure titanium is cold or hot formed with punch presses, bending rolls, brake presses, hydraulic presses and hammer facilities. Photographs. (G1, G6, Ti)

567-G. Temperature Field of a Turning Tool and the Reactions in the Zone of Contact. H. Opitz. *Microtecnic (English Ed.),* v. 8, no. 4, 1954, p. 183-188; disc., p. 189-190.

Temperature zones in cutting tools. Welding of chip to top rake face of tool. Electric potentials developed between tool and workpiece. Diagrams, graphs, circuits. (G17)

568-G. Simple Methods for Handling Sheet Metal Work. F. E. Riley. *Modern Machine Shop,* v. 27, Oct. 1954, p. 176-178.

Two helpful suggestions for handling frequently encountered sheet metal jobs in shops not ordinarily equipped to perform such work. Photographs. (G general)

569-G. The Mechanism of a Simple Deep-Drawing Operation. H. W. Swift. *Sheet Metal Industries,* v. 31, no. 330, Oct. 1954, p. 817-828.

Investigations on drawing cylindrical shells from flat blanks. Diagrams, graphs, tables. 8 ref. (G4)

570-G. The Forming of Aluminium Sheet. VIII. Hand Forming. H. Hinxman. *Sheet Metal Industries,* v. 31, no. 330, Oct. 1954, p. 837-841.

Covers hollowing, raising, cutting and filing. Photographs. (To be continued.) (G general, Al)

571-G. Electrospark Machining of Metals. I. S. Bulkin. *Henry Brutcher, Altadena, Calif., Translation no.* 3284, 10 p. (Condensed from *Vestnik Mashinostroeniya,* v. 32, no. 11, 1952, p. 44-49.)

New electrospark machining installations. Photographs, circuit. (G17)

572-G. Surface Grinding of Rolls by the Electrospark Method. B. M. Gorbunov. *Henry Brutcher, Altadena, Calif., Translation no.* 3310, 13 p. (From *Vestnik Mashinostroeniya,* v. 33, no. 7, 1953, p. 67-70.)

Results attainable with electrospark grinding as against abrasive-wheel grinding and specific merits of electrospark method. Diagrams, photograph, table. 6 ref. (G18)

573-G. (German.) **Belt Grinding or Disk Grinding?** G. Pahlitzsch and H. Windisch. *Metalloberfläche,* Ausgabe A, v. 8, no. 9, Sept. 1954, p. 132-141.

Comparison of grinding belts and disks from economic efficiency. Advantages of belts with multiple layer of grinding material. Diagrams, graphs, table, photographs. 33 ref. (To be continued.) (G18)

574-G. (German.) **New Information on the Wear of Cutters in the Milling of Structural Steel.** H. Opitz and K. H. Fröhlich. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 25, Sept. 1, 1954, p. 822-830.

Effect of initial cutter-to-steel contact, machining conditions, and type of wear, instruments for measuring and recording cutter wear photographically and graphically, force and temperature of cutting and vibrations. Table, diagrams, graphs, photographs, micrographs. 12 ref. (G17, ST)

575-G. (German.) **Research on the Spring-Back of Presses. Measuring Cutting Force, Spring-Back, and Cutting-Die Path.** H. H. Emschermann and H. Peter. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 25, Sept. 1, 1954, p. 831-834.

Factors affecting efficiency of punchpress dies, including choice of type of press and die design. Diagrams, photographs, graphs. (G1, G2)

576-G. (Russian.) **Efficient Cutting of Holes in Austenitic Steel by Countersinks.** G. S. Andreev. *Vestnik Mashinostroeniya,* v. 34, no. 8, Aug. 1954, p. 31-34.

Criteria for effective cutting, feed, speed, angle, etc. Effect of previous heat treatment of steel. Graphs, diagram, table. 2 ref. (G17, AY)

577-G. Some Tooling Problems in Jet Engine Production. R. E. Andrews. *Australasian Engineer,* 1954, Aug., p. 42-52; disc., p. 52-53.

Forging, investment casting, milling, turning, broaching, reaming, brazing. Photographs, diagrams. 5 ref. (G17, E15, F22, K8)

578-G. The Mechanism of a Simple Drawing Operation. H. W. Swift. *Engineering,* v. 178, Oct. 1, 1954, p. 431-435.

Review of experimental and analytical investigations which have been made into the mechanism of deep drawing. Graphs, tables, diagram. 10 ref. (G4, ST)

579-G. Skin Milling by Chemical Solution. Manuel C. Sanz. *Metal Progress,* v. 66, Oct. 1954, p. 141-144.

Hot alkaline baths under adequate control can dissolve aluminum alloys at uniform rates and at such speed as to compete with skin milling and to open new avenues in airframe construction and parts design. Diagram, photographs, graph. (G17, Al)

580-G. Fabricating Characteristics of Stainless Steels. Richard E. Paret. *Product Engineering,* v. 25, Oct. 1954, p. 196-201.

Vital selection factors that distinguish three basic types of stainless steel according to their adaptability to different fabricating processes. Photographs, tables. (G general, SS)

581-G. How to Drill and Rivet Titanium. Thomas A. Dickinson. *Steel,* v. 135, Oct. 18, 1954, p. 96-97.

Techniques and precautions for safe processing. Table, diagram, photographs. (G17, K13, Ti)

582-G. Applications Increase as Leaded Steels Take Cut at Machining Costs. *Steel,* v. 135, Oct. 25, 1954, p. 159-160, 162.

Increased machinability gained by adding lead to any steel is leading to rapidly expanding applications. Photographs, table, graph. (G17, T general, AY)

583-G. (English.) **Fundamental Research of the Superfinish.** Tokio Sasaki and Kenjiro Okamura. *Memoirs of the Faculty of Engineering, Kyoto University,* v. 16, no. 3, July 1954, p. 157-165.

Includes diagrams, table, graphs. (G19)

584-G. (Russian.) **Geometry of the Working Parts of Dies for Deep Drawing.** P. G. Kovtun. *Stanki i Instrument,* v. 25, no. 9, Sept. 1954, p. 21-23.

Defects due to poor quality of metal and to form and dimensions of die parts. Correction formulas. Diagrams, table. (G4)

585-G. (Swedish.) **Deep Drawing Properties of Sheet Steel. Fundamental Principles and Test Method.** Olov Svahn. *Jernkontorets Annaler,* v. 138, no. 9, 1954, p. 573-605; disc., p. 606-610.

Tests made on 10 grades of steel. Two cup tests appear to closely approximate actual practice. International discussion invited. Diagrams, graphs, tables, photographs. 49 ref. (G4, CN)

586-G. Numerical Control—What it Means to Metalworking. William M. Stocker, Jr., and Charles D. Emerson. *American Machinist,* v. 98, Oct. 25, 1954, p. 133-156.

Detailed discussion of complete automatization by electronic controls. Examples of complex operations in various fields of metal fabrication. Photographs, diagrams, tables. (G general)

587-G. Fabrication of Commercially Pure Titanium. Andrew N. Eshman. *Light Metal Age,* v. 12, Oct. 1954, p. 10-11.

Preparation and forming techniques. Photograph. (G general, F general, Ti)

588-G. Successful Fabrication of Titanium Afterburners. F. W. LaMartine. *Light Metal Age,* v. 12, Oct. 1954, p. 14-15.

Special techniques for RC-70 titanium. Photographs. (G general, Ti)

589-G. Air Force Titanium Machinability Report. III. *Light Metal Age,* v. 12, Oct. 1954, p. 22-23.

Test data on drilling, tapping, abrasive cutting and hacksawing. Table. (G17, G18, Ti)

590-G. How to Machine Magnetic Ingot Iron. W. E. McFee. *Modern Machine Shop,* v. 27, Nov. 1954, p. 136-142.

Summary of helpful suggestions based on shop experience. Photographs, tables, diagrams. (G17, Fe)

591-G. Precision Flame Cutting Is Cost-Saving Method for Short Run Production Parts. Max Pearlman. *Western Metals,* v. 12, Oct. 1954, p. 50-52.

Unique equipment offers short cuts on variety of shapes and sizes of steel plate. Photographs. (G22, CN)

592-G. Machinability of Boron-Treated Steels. F. J. Daasch. *Tool Engineer,* v. 33, Nov. 1954, p. 85-88.

Results of tool-life tests for standard steels and their boron-treated alternates. Table, graphs, micrographs. (G17, AY)

593-G. (Book.) **Constructional Steelwork Shop Practice: A Textbook for Apprentices and Students.** John Farrell. The Louis Cassier Co., Ltd., Dorset House, Stamford Street, London, S.E.1, England. 15s.; postpaid 15s 6d. Interscience Publishers, Inc., 250 Fifth Ave., New York 1, N. Y.

A practical work covering all stages of the steel fabricating industry. (G general, F general, ST)

594-G. (Book.) **The Grinding of Steel.** E. N. Simons. Odhams Press Ltd., 98, Long Acre, London, W.C.2, England. 25s.

Basic factors in grinding, practical techniques, finishing processes, and grinding machines. (G18, ST)

SECTION H

POWDER METALLURGY

1-H. Tailor-Made Metals and Their Properties. K. R. Beardslee. *Precision Metal Molding,* v. 11, Nov. 1953, p. 34-36, 76.

Techniques of processing, properties and applications of cemented carbides. Photographs, table. (H general, C-n)

2-H. The Sintering Process. II. Furnaces. Philip R. Kalischer. *Precision Metal Molding,* v. 11, Nov. 1953, p. 44-46, 76-80.

Design and use of sintering furnace and importance of time and temperature to the process. Graph, diagrams, table, photographs. (H15)

3-H. The Metal Powder Industry. Robert L. Ziegfeld. *Precision Metal Molding,* v. 11, Nov. 1953, p. 50-52, 93.

Excerpts from paper delivered before American Society of Tool Engineers, Sept. 14, 1953. Growth of the industry and its applications. (H general)

4-H. Metal-Ceramic Interactions. I. Factors Affecting Fabrication and Properties of Cermet Bodies. W. D. Kingery. *American Ceramic Society, Journal,* v. 36, Nov. 1953, p. 362-365.

Includes metal-ceramic reactions, surface and interfacial energies, constituent properties and the effect of the dispersed state on the properties. 22 ref. (H11, Cr, Zr, Ti, Th, Co, C-n)

5-H. Electrodeposition of Copper Powder. H. J. Modi and G. S. Tendolkar. *Journal of Scientific & Industrial Research,* v. 12, sec. A, Sept. 1953, p. 431-438.

Electrodeposition of copper powder from an acid copper sulphate bath and effects of adding glucose, glycerine, glue, gelatin and sodium naphthalene beta-sulphonate. Tables, micrographs. 13 ref. (H10, Cu)

6-H. (Polish.) **Sintered Contact Materials. IV. Laboratory Method for Obtaining Electric Contact Materials by Hot Pressing.** S. Stolarz. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 3, 1953, p. 135-142.

Chemical composition of contacts, sintering, current intensity and time and pressing pressures. Diagrams, tables, graphs, micrographs. 7 ref. (H14, W, Cu)

7-H. High Temperature Protection of a Titanium Carbide Cermet. John R. Wilson. *American Ceramic Society, Bulletin,* v. 32, Nov. 1953, p. 375-376.

Coating, containing chromium powder and high silica and baria frit, which protected cobalt-titanium crabide cermet against oxidation at 2200° F. Graphs, diagrams. (H general, Ti, Cr)

8-H. Super Refractories for Use in Jet Engines. Walther L. Havekotte. *Metal Progress,* v. 64, Dec. 1953, p. 67-70.

Manufacture, structure, mechanical properties and high-temperature oxidation resistance of various titanium carbide cermets. Graphs, photographs, tables. (H general, Ti, C-n)

9-H. (English.) **On the Mechanical Disintegration of Metal by a Stamp Mill.** Tosihiko Okamura, Koji Inagaki and Yoshimichi Masuda. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 1, Feb. 1953, p. 71-80.

Metal powders were prepared and particle sizes and distributions determined. Graphs, diagrams, micrographs. (H10, H11, Cu, CI, CN, Ag)

10-H. (German.) **Kinetics of Grinding Processes.** O. Theimer. *Kolloid-Zeitschrift,* v. 133, no. 1, Oct. 1953, p. 44-50.

Kinetic theory of powder grinding is extended to higher-order reactions. A procedure to find approximate values of grinding functions is established. Influence of the

approximations on numerical values. Graphs. 2 ref. (H10)

11-H. Cermets—Possible Answer to Ultra-High Temperatures. Alexander Pechman. *Finish,* v. 10, Dec. 1953, p. 37-38, 86, 88.

Production and properties of cermets. Applications of ceramic protective coatings in aircraft engines. Photograph, table. (H general, L27)

12-H. Design Trends of Powdered Iron Core Inductances as Used in the Electronics Industry. Bernard Goldsmith. *Metal Powder Association, Proceedings,* 1953, p. 14-21.

Electrical specifications, temperature coefficient and strength of cores. (H11, Fe)

13-H. Metal Powder Friction Materials in Heavy Duty Transmissions. J. E. Storer. *Metal Powder Association, Proceedings,* 1953, p. 49-59; disc., p. 59.

Tests and properties of different types of clutches. Photographs, graphs. (H general, Cu, ST)

14-H. Powder Metallurgy at the Cross Roads—Present and Future Possibilities. John D. Shaw and Walter V. Knopp. *Metal Powder Association, Proceedings,* 1953, p. 63-68.

Numerous factors having significant bearing on potentials of powder metallurgy. (H general)

15-H. Non-Metallic Impregnation of Sinterings. Wilson N. Pratt. *Metal Powder Association, Proceedings,* 1953, p. 78-80; disc., p. 80-82.

Important characteristics of synthetic resins for successful impregnation. Photograph, micrographs. (H16)

16-H. Review of Aluminum Powder Metallurgy. J. B. Haertlein and J. F. Sachse. *Metal Powder Association, Proceedings,* 1953, p. 83-92; disc., p. 92-94.

Aluminum powder manufacture, two important uses and art of fabrication. Tables, graph. (H general, Al, Fe)

17-H. Powdered Metals Enter Stainless Stage. W. L. Batten. *Steel,* v. 133, Dec. 21, 1953, p. 78-81.

Stainless steel powder production, applications, properties and outlook. Photograph, diagram, tables. (H general, SS)

18-H. (Hungarian.) **The Development of Aluminum Powder Metallurgy. III.** György Halmos. *Aluminium (Budapest),* v. 5, no. 8, Aug. 1953, p. 165-175.

Experiments in Hungary with aluminum powder and scrap aluminum powder. Results of various tests of hardness, heat resistance, cold forming, weldability, machinability and electric conductivity. Possibilities for application of sintered aluminum bodies. Photographs, micrographs, tables, graphs, diagrams. 37 ref. (H general, Al)

19-H. The Processing, in the Higher Density Range, of Durable, Precision Iron Powder Parts on a Production Basis. William J. Doelker and Harold T. Harrison. *Metal Powder Association, Proceedings,* 1953, p. 22-46; disc., p. 47.

Important characteristics of powders, physical properties, dimensional tolerances of parts and tool life. Graphs, diagrams, tables, micrographs. (H general, Fe)

20-H. Powder Metal Applications. *Metal Industry,* v. 83, Dec. 25, 1953, p. 517-520.

Includes photographs, diagrams. (H general, T general, AY, Cu)

21-H. Dependable, Low Cost Powdered Metal Supply. Julius Sachse. *Precision Metal Molding,* v. 12, Jan. 1954, p. 37, 83-87.

Reviews uses of metal powders other than pressing and sintering of parts and bearings. Photographs. (H general)

22-H. Sintered Manganese Steels. F. Benesovsky and R. Kieffer. Henry Brutcher, Altadena, Cal., Translation no. 2974, 15 p. + 1 plate. (From *Berg- und huttenmännische Monatshefte,* v. 95, no. 8, 1950, p. 145-150.)

Manganese steels of known composition, containing 2-16% manganese and 0.2-1.6% carbon, can be technically produced without difficulties by sintering method. Graphs, micrographs. 22 ref. (H15, AY)

23-H. Sintering of Tungsten Carbide-Cobalt Compositions as Surface Reaction. W. Dawihl. Henry Brutcher, Altadena, Cal., Translation no. 3067, 11 p. (From *Zeitschrift für Metallkunde*, v. 43, no. 1, 1952, p. 20-22.)

Previously abstracted from original. See item 42-H, 1952. (H15, Co, W, C-n)

24-H. The Theory of Sintering. G. A. Geach. Paper from "Progress in Metal Physics". Interscience Publishers, Inc., p. 174-204 + 1 plate.

Includes graphs, tables, diagram. 80 ref. (H15)

25-H. (German.) **The Description and Evaluation of Different Types of Zinc Powders.** H. Enzfelder. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben,* v. 98, no. 11, Nov. 1953, p. 234-236.

Classification of zinc powders according to source or grain size. Hydrogen evolution and its effectiveness in precipitating metallic impuri-

ties from zinc solutions. Micrographs, tables, graphs. 4 ref. (H11, Zn)

26-H. (German.) **Sintered Nickel-Copper Alloys. (Monel).** F. Benesovsky. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 894-895.
Literature review. Problem of producing finished parts by powder metallurgy. Tables, micrographs. 6 ref. (H15, Ni, Cu)

27-H. (German.) **Heat Resisting Materials and Cermets.** Bruno Waeser. *Werkstoffe und Korrosion,* v. 4, no. 11, Nov. 1953, p. 397-399.
Literature review. Combination of properties that afford protection up to 1000° C. Tables, graphs. 28 ref. (H general, AY, Cr, Ni, Fe, Co)

28-H. (Polish.) **Fundamentals of Handling Technological Documentation Illustrated by the Case of Powder Metallurgy.** Edmund Bryjak. *Hutnik,* v. 20, no. 12, Dec. 1953, p. 367-374.
Symbolization in production departments, systematization of documents, technological short-cuts, work regulation and machines. Tables. 3 ref. (H general)

29-H. **Precision Parts Sintered in Gas-Fired Furnace.** Robert O. Borden. *Industrial Gas,* v. 32, Jan. 1954, p. 3-5.
Meter operation is improved and maintenance minimized. Production is increased and cost of parts considerably reduced. Diagrams, photographs, table. (H15)

30-H. **Analysis of the Area Determinations of Copper Powders.** B. D. Cuming and J. H. Schulman. Paper from "Recent Developments in Mineral Dressing, Symposium." p. 5-9; disc., p. 85-97. Sept. 1952. Institute of Mining and Metallurgy, London, England.
Adsorption isotherms were carried out on heated and unheated copper surfaces from gaseous, petroleum ether, and aqueous environment. Results are compared to geometrical and air-permeability 'areas.' Graphs, table. 5 ref. (H12, B14, Cu)

31-H. **Metal Powders Ease Production Headaches.** Allen G. Gray. *Steel,* v. 134, Jan. 25, 1954, p. 88-91.
Growing list of cost-saving applications being made in industry. Photographs. (H general)

32-H. (Polish.) **Atomization of Low Melting Metal Powders.** W. Rutkowski and W. Cegielski. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 5, Sept.-Oct. 1953, p. 291-297.
Apparatus for atomization of molten tin, lead, and zinc. Operating conditions of atomization. Various properties of the powders. Micrographs, tables, diagrams. 5 ref. (H10, H11, Sn, Pb, Zn)

33-H. (Russian.) **Properties of Iron Powder Obtained by Pulverization.** V. I. Prosvirin and A. F. Silaev. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 59-61.
Powders obtained by compressed air pulverization have better properties than those obtained by centrifugal pulverization. Graphs, table, micrographs. (H10, H11, Fe)

34-H. **Piston Rings of Iron Powder.** Alfred Hermanns. *Precision Metal Molding,* v. 12, Feb. 1954, p. 35-37, 78-81.
Economical and metallurgical advantages of this method. Microphotographs, graph. (H general, Fe)

35-H. **Compacting and Sintering of Metal Powders Studied on Basis of Their Electrical Conductivity.** V. I. Likhtman and L. T. Nazarov. Henry Brutcher, Altadena, Cal., Translation no. 3065, 13 p. (From *Zhurnal Tekhnicheskoi Fiziki,* v. 22, no. 4, 1952, p. 696-702.)
Discusses electrical conductivity of metal-powder compacts as consistent function of size, character, and number of areas of contact. Experimental set-up and procedure. Tables, graphs. 5 ref. (H11, Fe, Cu)

37-H. **Crystal-Lattice Distortions and Sintering of Metal Powders.** L. I. Gal'perina, Ya. E. Geguzin, N. Ya. Pines and I. V. Smushkov. Henry Brutcher, Altadena, Cal., Translation no. 3088. 7 p. (From *Doklady Akademii Nauk SSSR,* v. 88, no. 2, 1953, p. 265-268.)
Processes of stress relief and elimination of crystal-lattice distortions in metal-powder compacts studied by X-ray diffraction and by heat capacity measurements. Table, graphs. 7 ref. (H11, H15, Cu, Ni, Fe)

38-H. **Economic Survey of Seven Methods of Making Small Machine Parts.** Samuel Storchheim. *Metal Progress,* v. 65, Feb. 1954, p. 77-80.
Six manufacturing methods compared with powder metallurgy method in manner analogous to that which a machine parts designer might use for comparison. Table, photograph. (H general, G general, E12, E13, E15)

39-H. **Powder-Metallurgy Technique.** *Overseas Engineer,* v. 27, Feb. 1954, p. 254-255.
Reports that heavy machining costs can be eliminated or reduced on components of complex section. Photographs, drawings, table. (H general)

40-H. **Metal-Ceramic Interactions. IV. Absolute Measurement of Metal-Ceramic Interfacial Energy and the Interfacial Adsorption of Silicon From**

Iron-Silicon Alloys. W. D. Kingery. *American Ceramic Society, Journal,* v. 37, Feb. 1954, p. 42-45.

Surface and interfacial energies in the system $Ni\text{-}Al_2O_3$ and $Ni\text{-}ZrO_2$ determined at elevated temperatures by means of equilibrium interfacial angle measurements. Diagrams, graphs, tables. 12 ref. (H11, P10, Ni)

41-H. Sintered Refractory Alloys. A. Carter. *Metallurgia,* v. 49, no. 291, Jan. 1954, p. 8-14.

Use of metal refractory alloys in gas turbines operating at high temperatures. Tables, micrographs. 27 ref. (H general, T25)

42-H. Powder Metallurgy Gaining in West Coast Use. Irving J. Donahue. *Western Machinery and Steel World,* v. 45, Feb. 1954, p. 99-102.

Developments in powder metallurgy have come at an increased rate. Tables, drawings. (H general)

43-H. (German.) **The Electrolytic Deposition of Metal Powders. The Theory of Discharge of Complex Ions.** N. Ibl and G. Trümpler. *Helvetica Chimica Acta,* v. 36, no. 7, 1953, p. 2023-2027.

Deposition and neutralization of complex ions at the cathode explained as cause of loose or spongy metal deposits from salt solutions. 46 ref. (H10)

44-H. (German.) **Sintering Copper.** O. Kayser, O. Knacke and I. N. Stranski. *Zeitschrift für Elektrochemie,* v. 57, no. 10, 1953, p. 924-927.

Experiments to investigate adherence of copper sphere to copper rod at 520 to 730° C. as a function of time. Diagrams, graphs, table. 18 ref. (H15, Cu)

45-H. Preliminary Results on the Infiltration of Titanium Carbide With Cobalt. Herman Blumenthal. *Powder Metallurgy Bulletin,* v. 6, Dec. 1953, p. 186-188.

Infiltration method and materials used. Results of tests. Table. 6 ref. (H16, Ti, C-n, Co)

46-H. Investigation of the Mechanism of the Formation of Titanium Carbide in Vacuo. G. A. Meerson and O. E. Krein. *Henry Brutcher, Altadena, Calif., Translation no.* 3121, 17 p. (From *Zhurnal Prikladnoi Khimii,* v. 25, no. 2, 1952, p. 134-147.)

Influence of reduced pressures and of temperature on degree of carburization of titanium. Choice of optimum conditions for producing titanium carbide of theoretical composition. Tables, graphs. 7 ref. (H general, C-n)

47-H. New Process for the Reduction of Iron Powders. H. Siepmann. *Henry Brutcher, Altadena, Calif., Translation no.* 3192, 12 p. (From *Stahl und Eisen,* v. 73, no. 6, 1953, p. 360-364.)

Previously abstracted from original. See item 43-H, 1953. (H10, Fe)

48-H. (English.) **Studies on the Sintering of the Metallic Powder of the Iron Family. I. Magnetic Properties of the Sintered Iron Compact. II. The Effect of the Atmosphere on the Sintered Metallic Compact.** Akinori Takasaki. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 4, Aug. 1953, p. 358-376.

Effects of porosity, carbon content and sintering variables on magnetic properties. Diagrams, tables, graphs, micrographs. (H15, P16, Fe)

49-H. (English.) **Studies on the Sintering of the Metallic Powder of the Iron Family. III. On the Sintering of Cast Iron Powder. IV. Studies on the Sintered M.K. Type Magnet.** Akinori Takasaki. *Science Reports of the Research, Institutes, Tohoku University,* Series A, v. 5, no. 5, Oct. 1953, p. 469-492.

Studies on cast iron pulverized in a stamp mill and Alnico-type combinations of iron, aluminum and cobalt powders. Effects of particle size and sintering time and atmosphere. Diagrams, graphs, tables. 4 ref. (H15, P16, Al, Fe, Ni, Co, CI)

50-H. (German and French.) **Properties and Applications of Sintered Aluminum.** R. Irmann. *Aluminium Suisse,* v. 4, no. 1, Jan. 1954, p. 24-32.

Preparation and mechanical and physical properties of powder. Photographs, graphs, micrographs, tables. 25 ref. (H10, H11, Al)

51-H. (German.) **The Process of Thermal Reaction.** S. Krapf. *Berichte der deutschen keramischen Gesellschaft,* v. 31, no. 1, Jan. 1954, p. 18-21.

Process of producing ceramic or metal-ceramic bodies based on principle of first igniting a reactive mixture which will then react exothermally to form desired compounds. Diagrams, graph, photographs. (H12, Al, Cr, Fe)

52-H. (Portuguese.) **Study of Properties of Sintered Brasses and Bronzes.** Vicente Chiaverini and Carlos de Revoredo Barros. *ABM (Boletim da associacao brasileira de metais),* v. 9, no. 32, July 1953, p. 313-331.

Physical characteristics of brasses and bronzes obtained by powder metallurgy under various conditions of molding pressure and sintering temperature. Proves possibility of producing these alloys by sintering

with reasonable density and mechanical-property values. Photographs, micrographs, tables, graphs. 8 ref. (H14, H15, Cu, Zn, Sn)

53-H. Fundamental Study and Equipment for Sintering and Testing of Cermet Bodies. VI. Fabrication, Testing and Properties of 72 Chromium—28 Alumina Cermets. Thomas S. Shevlin. *American Ceramic Society, Journal,* v. 37, Mar. 1954, p. 140-145.

Physical and mechanical properties, impact resistance and thermal effects. Graphs, micrograph, table, photographs. 8 ref.
(H11, H15, Cr, Al)

54-H. Cermet Solid Bodies and Coatings for Gas Turbine Engine Blading and Metal Parts. Earle T. Montgomery. *Engineering Experiment Station News (Ohio State University),* v. 26, Feb. 1954, p. 39-40.

Composition and selection of components, properties, techniques and their value. (H general, T25)

55-H. Sintered Parts. *Iron Age,* v. 173, Mar. 11, 1954, p. 164, 166-167, 169.

Manufacture of sintered bronze oil-impregnated bearings. Diagram, photograph. (H15, H16, Cu)

56-H. (Czech.) **Manufacture of Metal Powders by Amalgam Methods.** Jan Kaloc. *Hutnické Listy,* v. 9, no. 2, Feb. 1954, p. 83-88.

Laboratory production of iron, nickel, manganese, cobalt and chromium powder. Diagrams, micrographs. 11 ref.
(H10, Fe, Ni, Mn, Co, Cr)

57-H. (Hungarian.) **Heat Treatment of Iron Powder.** Ferenc Kardos. *Magyar Kémiai Folyoirat,* v. 60, no. 2, Feb. 1954, p. 37-42.

Method makes iron powder applicable in telecommunication equipment. Graphs, micrographs.
(H10, T1, Fe)

58-H. (Polish.) **Self-Lubricating Iron Bearings.** W. Cegielski. *Prace Instytutow Ministerstwa Hutnictwa,* 1954, no. 6, p. 338-358.

Developments in manufacturing and utilization, effects of pressing pressure, sintering temperature and grain size on properties of the bearings. Diagrams, tables, graphs, micrographs. 9 ref.
(H general, T7, Fe)

59-H. Components From Powder. *Aeroplane,* v. 86, Mar. 5, 1954, p. 275.

Production of ferrous and nonferrous parts from sintered metal powders. Photographs. (H general)

60-H. Carbides. *Iron Age,* v. 173, Mar. 4, 1954, p. 170-172.

Single, solid pieces of cemented carbide to 4000 lb. can be produced in a 220-ton hot press capable of producing parts for large die sections, rolls for rolling steel strip, large punches for cold extrusion work and large wear resistant linings for brick molds. Photographs.
(H14, T5, C-n)

61-H. A Physical Explanation of the Empirical Laws of Comminution. D. R. Walker and M. C. Shaw. *Mining Engineering,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, Mar. 1954, p. 313-320.

Comminution is shown to be basically the same process as metal grinding. 12 ref. (H10, G18)

62-H. (French.) **Determination of the Grain-Size Classification of a Crystalline Powder by X-Ray Diffraction.** René Bernard and Raymond Riviere. *Comptes rendus,* v. 238, no. 6, Feb. 8, 1954, p. 666-669.

Results of experiments with tungsten carbide. Graphs. 5 ref.
(H11, W)

63-H. (German.) **Production and Properties of Electrolytic Iron Powder.** Ivan Ljungberg. *Stahl und Eisen,* v. 74, no. 5, Feb. 25, 1954, p. 279-285.

Method through which properties may be varied in a wide range. Table, graphs, diagram. 15 ref.
(H11, Fe)

64-H. (Italian.) **Fabrication and Qualities of Sintered Aluminum Powder.** A. von Zeerleder. *Metallurgia italiana,* v. 46, no. 1, Jan. 1954, p. 7-8.

Characteristics, production and uses. (H general, Al)

65-H. Borides Designed for High Temperature Use. Paul Schwarzkopf and F. W. Glaser. *Iron Age,* v. 173, Apr. 1, 1954, p. 138-139.

Sintered borides of zirconium, chromium and molybdenum, developed to meet special defense needs, have potential applications in industry. Table, photograph, graph.
(H general, Cr, Mo, Zr)

66-H. Centrifugal Compacting. A New Method for Producing Metal Powder Parts. Robert C. Lindberg. *Materials & Methods,* v. 39, Apr. 1954, p. 86-87.

Economies and uniform density in large parts made with heavy powders. Application of method to form tungsten carbide bullet cores. Photographs. (H14)

67-H. Infiltration Improves Properties of Metal Powder Parts. John L. Everhart. *Materials & Methods,* v. 39, Apr. 1954, p. 88-90.

Advantages, applications and techniques of process. Photographs, table, graph. 7 ref. (H16)

68-H. Metal Supplies and Powder Metallurgy To-Morrow. H. W. Greenwood. *Metallurgia,* v. 49, no. 293, Mar. 1954, p. 135-136.

Application of hydro-metallurgical and ion exchange methods producing powders from low grade metal ores. 8 ref.
(H10, Ni, Co, Cu, U)

69-H. Fabrication of Beryllium by Powder Metallurgy. Wallace W. Beaver. *Metal Progress,* v. 65, Apr. 1954, p. 92 + 9 pages.

Condensed from paper presented at Beryllium Symposium ASM Meeting, Boston, Mar. 1954. Powdering and reconsolidation practices. Mechanical and physical properties of blanks and semifinished products. Micrographs, graphs, tables, photographs.
(H general, Q general, P general, Be)

70-H. Metal Powders for Brake and Clutch Work Surfaces. L. P. Kane. *Precision Metal Molding,* v. 12, Apr. 1954, p. 37-38, 123.

Accurate control of friction properties is useful attribute of powdered metal components. Photographs. (H11, Q9)

71-H. High Propertied Powdered Iron Parts for Motorcycles and Bicycles. Gerhard Zapf. *Precision Metal Molding,* v. 12, Apr. 1954, p. 40-42, 125.

Using electrolytic iron powder as a raw material and copper as an alloying component, Husqvarna, Sweden, now produces three distinct qualities of sintered steels, giving different physical properties. Photographs, tables. (H general, Fe, Cu)

72-H. Brazing: It's One of the Uses for Infiltration of Powder Parts. Clyde C. Clark. *Precision Metal Molding,* v. 12, Apr. 1954, p. 57-58, 126.

Infiltration consists of use of a liquid phase of lower melting material to fill pores of a skeleton or matrix of higher melting material. Properties and uses presented. Micrographs. (H16)

73-H. Powder Metallurgy Directory. *Precision Metal Molding,* v. 12, Apr. 1954, p. 59 + 6 pages.

Reference tables of characteristics of metal powders, and of parts produced from metal powders, indicate nominal or typical properties of these materials. Tables.
(H11, Cu, Fe)

74-H. Industry Takes to Powder. Thomas A. Kindre. *Steelways,* v. 10, Apr. 1954, p. 12-15.

Old metalworking method is used to turn out parts for automobiles and hundreds of other mechanical devices. Powder metallurgy has proved a cost-cutting boon for many manufacturers. Photographs, drawings. (H general)

75-H. (French.) **Static and Dynamic Measurement of the Elastic Modulus of Sintered Materials.** J. Barducci and R. Cabarat. *Revue de métallurgie,* v. 51, no. 3, Mar. 1954, p. 149-153.

Measurements under very low stress by wire resistance strain-gages and by high-frequency vibration agree for most materials. Tables, graph, diagram. 3 ref.
(H11, Q21, Cu, Sn)

76-H. (German.) **Technical Sintering Materials From the System Fe-Cu.** Gerhard Zapf. *Stahl und Eisen,* v. 74, no. 6, Mar. 11, 1954, p. 338-347.

Strength properties approximate those of rolled steel. Tables, photographs, diagram, graphs. 21 ref.
(H15, Q23, Cu, Fe)

77-H. Single, Solid Pieces of Cemented Carbide Produced on Hot Press. *Modern Industrial Press,* v. 16, Apr. 1954, p. 32.

Operation of press for production of single, solid pieces up to 4000 lb. Photographs. (H14, C-n)

78-H. Pore-Size Distribution of Porous Iron. P. Swietering and H. L. T. Koks. *Nature,* v. 173, Apr. 10, 1954 p. 683-684.

Penetration of mercury under pressures up to about 1000 atmospheres is especially suited for determination of pore sizes greater than 100 A. Tables, graphs. 3 ref.
(H11, Fe)

79-H. The Structure of Carbonyl Iron. A. Taylor. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 202-217 + 3 plates; disc., p. 217.

X-ray investigation of various powders. Crystallite size and lattice stresses in E-type and C-type powders measured. Graphs, micrographs, tables, radiographs.
(H11, M26, Fe)

80-H. 50-50 Carbonyl Nickel-Iron Powders. C. E. Richards and D. C. Shotton. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 247-252.

Examination by magnetic and X-ray diffraction methods shows that it is unnecessary to exceed 500 to 600° C. to complete alloying of the powder. Table, graph.
(H12, P16, Ni, Fe)

81-H. (German.) **Investigation of Sintering Phenomena by Using Radioisotopes.** Horst Schreiner and Gottfried

Glawitsch. *Zeitschrift für Metallkunde,* v. 45, no. 3, Mar. 1954, p. 102-108.

Methods, equipment and application to difficult powder metallurgical problems. Diagram, table, graphs. 11 ref.
(H15, S19, Th, Cu, Fe, Ni)

82-H. (German.) **Anisotropy of Electric Conductivity in Some Powder Metal Contact Materials.** Albert Keil and Carl-Ludwig Meyer. *Zeitschrift für Metallkunde,* v. 45, no. 3, Mar. 1954, p. 119-122.

Effect of composition, method of preparation and other factors on silver-graphite mixtures. Diagrams, micrographs. 5 ref. (H11, P15, Ag)

83-H. (German.) **Kinetics of Sintering.** Johannes Gerlach and Ottmar Knacke. *Zeitschrift für Metallkunde,* v. 45, no. 3, Mar. 1954, p. 123-127.

Investigation by press welding of cadmium blanks. Influence of pressure and temperature on strength of the weld. Analysis of welding process. Diagram, graphs, micrograph. 27 ref. (H15, K5, Cd)

84-H. (Book—German.) **Plansee Report for Powder Metallurgy. (Planseeberichte fur Pulvermetallurgie).** v. I. no. 4. Metro-Cutanit, Ltd., Grappenhall, Warrington Lancs, England.

Three articles include gas adsorption in powdered and sintered products; properties of sintered nickel-copper alloys; summary of developments in methods of melting.
(H general, C general, Ti, Zr, Hf, V, Ta, Cr, Mo, W)

85-H. **A New Carbide-Base Cermet Containing TiC, TiB_2, and CoSi.** Harold M. Greenhouse, Robert F. Stoops and Thomas S. Shevlin. *American Ceramic Society, Journal,* v. 37, May 1954, p. 203-206.

Development and properties. Has excellent load-carrying properties at 1800° F. Tables, graphs, micrographs. 5 ref.

(H general, P general, Q general)

86-H. **Method Described for Evaluation of Lubricants in Powder Metallurgy.** I. Sheinhartz, H. M. McCullough and J. L. Zambrow. *Journal of Metals,* v. 6, May 1954, p. 515-518.

Experimental procedure leads to series of mathematical relationships to predict results. Diagram, graphs, tables. 7 ref. (H13)

87-H. **The Warm Pressing of Beryllium Powder.** Norman P. Pinto. *Journal of Metals,* v. 6, May, 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 629-633.

Compacting below recrystallization temperature studied. Ideal density attained at 550 to 600° C. using 25 tons per sq. in. Graphs, diagrams, tables, micrographs. 12 ref.
(H14, Be)

88-H. **What About the Army's Powdered Iron Rotating Bands?** *Precision Metal Molding,* v. 12, May 1954, p. 48, 70-71.

Answers pertinent questions in regard to specifications, supply, working ability and testing.
(H general, Fe)

89-H. **Powdered Iron Cores of Today.** John C. Webb. *Precision Metal Molding,* v. 12, May 1954, p. 52, 88-90.

Uses of hydrogen-reduced iron powder, magnetite, electrolytic iron powder, carbonyl iron powder and synthetic iron oxides.
(H general, Fe)

90-H. **A New, Prealloyed, Stainless Steel Powder.** A. Adler. *Precision Metal Molding,* v. 12, May 1954, p. 54-56, 80-81.

Properties similar to sheet and bar stock. Ferritic chromium stainless types and certain high-nickel alloys produced by this method. Tables.
(H11, SS)

91-H. (Russian.) **Temperature Effect on the Cathode During Electrodeposition of Powdered Cadmium.** D. N. Gritsan and A. M. Bulgakova. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 2, Feb. 1954, p. 258-264.

Various effects with increased current density and decreased concentration of the electrolyte. Table, graphs. 11 ref. (H10, Cd)

92-H. (Russian.) **Influence of Anions on the Temperature Effect on the Cathode During Electrodeposition of Powdered Metals.** D. N. Gritsan, A. M. Bulgakova, and G. A. Zolotareva. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 2, Feb. 1954, p. 337-344.

Increased magnitude of temperature effect on cadmium, zinc and copper salts with increased current density. Tables, graphs. 9 ref.
(H10, Cd, Zn, Cu)

93-H. **Alloy Steels and Powder Metallurgy.** H. W. Greenwood. *Engineer,* v. 197, May 7, 1954, p. 676-677.

Production of alloy steels by powder metallurgy offers many advantages. Use of oxides and other compounds improves physical properties, with enhanced resistance at high temperatures to corrosion, oxidation and other causes of metallic deterioration. 5 ref. (H general, AY)

94-H. **Production and Properties of High-Purity Nickel B7 Powder.** F. A.

Forward. *Institute of Metals, Journal,* v. 82, 1954; *Institute of Metals, Bulletin,* v. 2, May 1954, p. 113-116.

New process developed to produce powder from Canadian ore. Consists of a combined ammonia-leaching and hydrogen-reduction operation. Table, graph, micrographs. (H10, H11, Ni)

95-H. (German.) **Hot Pressing Molded Parts of Copper Powder.** R. Palme. *Metall,* v. 8, nos. 9-10, May 1954, p. 369-371.

Oxidation prevented by use of methylene. Increased hardness properties. Diagram, graphs, table, micrograph. 8 ref. (H14, Cu)

96-H. (German.) **Recent Developments in Field of Powder Mettallurgy.** F. Benesovsky. *Metall,* v. 8, no's. 9-10, May 1954, p. 378-385.

Literature review. Photographs. 145 ref.
(H general, Ni, Ag, W, Al, Fe, Cu)

97-H. (Russian.) **Investigation of Oxidation Processes of Iron Powder at High Temperatures.** P. D. Dankov and N. K. Andrushchenko. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 3, Mar. 1954, p. 519-524 + 2 plates.

Oxidation velocity at temperatures of 200, 400, 600, 800 and 1000° C. 3 ref. (H11, Fe)

98-H. Sheet Metals Can Be Made From Metal Powder. W. D. Jones. *American Machinist,* v. 98, June 7, 1954, p. 142-144.

Continuous manufacture of sheet, rods, tubes and extruded sections from powders extracted directly from ores eliminates steps in fabricating processes. Photographs. (H10)

99-H. Bonding in Cermets. L. S. Williams and P. Murray. *Metallurgia,* v. 49, no. 295, May 1954, p. 210-217.

Surface and bulk interaction and interfacial tension conditions. Tables, graphs. 27 ref.
(H14, Cu, Au, Ag)

100-H. (French.) **The Properties of Semifinished Products Made From Compacts of Oxidized Aluminum.** J. Hérenguel and J. Boghen. *Revue de métallurgie,* v. 51, no. 4, Apr. 1954, p. 265-277; disc., p. 277.

Factors affecting properties of sintered products. Tables, graphs, micrographs. 8 ref. (H11, Al)

101-H. (German.) **Activation Energy of the Sintering Process.** Gerhard Bockstiegel, Georg Masing and Gerhard Zapf. *Applied Scientific Research,* v. 4, sec. A, no. 4, 1954, p. 284-294.

Density increase during sintering of iron powder bodies below 908° C. Relation of activation energies for sintering and self diffusion. Tables, graphs. 6 ref. (H15, P12, Fe)

102-H. (Book.) **Production of Cermets by Flash Sintering Process.** Wright Air Development Center. Report No. PB 111286. 69 p. 1952. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $2.00.

Production of turbojet engine blades and other temperature-resistant components. Historical background of process, description of flash-sintering equipment, and discussion of test results. (H15)

103-H. Silicon-Base Cermets and Related Observations. B. C. Weber and P. S. Hessinger. *American Ceramic Society, Journal,* v. 37, June 1954, p. 267-272.

Cermets in the system silicon-titanium dioxide and silicon-titanium carbide investigated along with combinations of titanium carbide and titanium silicides. Photographs, X-ray patterns, graph. 19 ref.
(H general, Si, Ti)

104-H. Production of Aluminium Powder and Paste in India. H. S. Amin. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 285-294; disc., p. 294-295.

Hall process employed in manufacture of aluminum paste for use in paints. Properties and specification of aluminum pigments. Table, flow sheet. 10 ref. (H10, Al)

105-H. Recent Powder Metallurgy Developments. Henry H. Hausner. *Industrial Heating,* v. 21, June 1954, p. 1098, 1100.

Application of metal compounds for production of large-sized products. (H general, Zr)

106-H. (French.) **Differences Between Cathodic Atomization of Electrolytes and Pulverization of Metals.** Pierre Barret. *Comptes rendus,* v. 238, no. 19, May 10, 1954, p. 1883-1885.

Powdered sodium produced by electrolysis of fused salts. 3 ref. (H10, Na)

107-H. (French.) **Comparison of Methods of Microscopic and Micro-Radiographic Examination in the Study of Diffusion by Sintering of Iron Powder of Different Origin.** Georges Cizeron. *Métaux, Corrosion-Industries,* v. 29, no. 344, Apr. 1954, p. 167-180.

Mechanical properties and porosity of structure. Tables, micrographs, diagrams. 7 ref.
(H15, Q general, N1, Fe)

108-H. (English.) **A Fundamental Investigation of the Mechanism of Sintering.** E. B. Allison and P. Murray. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 487-512.

Data on sintering of fluorides by a continuous, dilatometric method, and effects of initial compacting pressure and particle size distribution of powder. Measurement of flow properties of glass and sodium fluoride at elevated temperatures and subsequent comparison of flow constants with those deduced from sintering data. Tables, graphs, diagrams. 8 ref. (H15, B)

109-H. (English.) **Experimental Iron Carbonyl Powders.** F. E. Jaumot, Jr., and L. Muldawer. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 513-519.

Strain and crystallite size determined by method of Warren and Averbach. Graphs, tables. 12 ref. (H11, Fe)

110-H. (French.) **Sintered Thermionic Cathodes Made of Nickel and Alkali Earth Oxides.** G. Mesnard and R. Uzan. *Vide,* v. 9, no. 50, Mar. 1954, p. 1492-1507.

Preparation of cathodes by compression and sintering of mixture of coprecipitated barium and strontium carbonates with nickel powder. Technical achievements of experimental tubes and measurements of emission in steady state and pulse operation. Graphs. 4 ref. (H14, H15, T1, Ni)

111-H. (Polish.) **Powdered Magnetic Materials.** W. Rutkowski and H. Rutkowska. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 1, 1954, p. 20-28.

Production and properties of hard and soft magnets. Tables, graphs, micrographs, photographs. (H general, P16, SG-n, p)

112-H. Sintering Characteristics of Iron-Zinc Powder Blends. A. A. Krishnan. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 271-281.

Shrinkage, density and hardness of compacts as a function of pressing pressure and sintering temperature. Graphs, photographs, micrographs, table. 6 ref. (H14, H15, Fe, Zn)

113-H. Development of a New Self-Coated Corrosion Resistant Porous Body. A. A. Krishnan. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 283-293.

"Sweat out" process used to produce bodies from blends of iron and zinc powders. Table, graphs, micrographs. 7 ref. (H general, Fe, Zn)

114-H. Powder Metallurgy Technique for High Density, High Strength Parts. Edmund N. Mazza. *Precision Metal Molding,* v. 12, July 1954, p. 42-45.

Procedure to obtain iron alloys of high density and high strength by alloying during sintering. Tables, graphs. 3 ref. (H15, Fe)

115-H. (English.) **Covering of a Plane Surface With Granular Material.** Z. Bodo and I. Hangos. *Acta Physica Academiae Scientairum Hungaricae,* v. 3, nos. 3-4, May 30, 1954, p. 155-169.

Degree of covering determined theoretically and checked experimentally for samples of homogeneous grain size. Extension of results to powder mixtures. Graphs, micrographs, diagram. 1 ref. (H general)

116-H. Porous Metals in Aircraft. David B. Pall. *Aeronautical Engineering Review,* v. 13, July 1954, p. 36-41.

Properties of porous bronze and stainless steel. Uses in de-icing equipment, transpiration cooling, and filtration of fuels and lubricants. Tables, graphs, diagrams. 16 ref. (H general, T24, Cu, SS)

117-H. Machining, Joining and Finishing of Powder Metal Parts. ASM Committee on Powder Metallurgy. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 151-153.

Drilling, tapping, reaming, turning, boring, milling, shaping, grinding, burnishing, coining, joining, impregnation and infiltration, heat treating, and finishing. Diagrams, table. 7 ref.

(H general, G17, J general, L general)

118-H. (Russian.) **Regularities of Pressing Copper-Graphite Metal-Ceramic Compositions.** T. N. Znatokova and V. I. Likhtman. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 577-580.

Compressibility investigation on electrolytic copper with natural graphite. Tables, graphs. 2 ref. (H11, Cu)

119-H. (Russian.) **Permanent Magnets From Powders.** A. B. Al'tman. *Elektrichestvo,* 1954, no. 6, June, p. 65-69.

Production, structure, and properties. Graphs, tables. 6 ref. (H general, SG-n)

120-H. New Directions in Powder Metallurgy. Henry H. Haussner. *Precision Metal Molding,* v. 12, Aug. 1954, p. 42.

Use of metal hydrides. Making large-sized products by sinter welding and rolling metal powders. (H general)

121-H. Physical Properties of Powdered Brass Parts. D. C. Bradley. *Precision Metal Molding,* v. 12, Aug. 1954, p. 44-47, 81-82.

Variables affecting properties, and

ductility of brass sinterings. Sintered density vs. properties. Graphs. (H11, Q23, Cu)

122-H. (German.) **The Powder-Metallurgical Method of Producing Copper Strip.** Hermann Franssen. *Zeitschrift für Metallkunde,* v. 45, no. 6, June 1954, p. 328-331.

Equipment and techniques for continuous production. Precautions in the production of alloys. Diagrams, photograph. 5 ref. (H general, Cu)

123-H. Powder Metallurgy of Zirconium and Beryllium. H. H. Hausner and H. B. Michaelson. Paper from "Nuclear Engineering Pt. I.", American Institute of Chemical Engineers, p. 11-21.

Powder preparation, compacting, sintering, properties of sinterings. Graphs, tables, micrographs. 9 ref. (H10, H14, H15, H11, Be, Zr)

124-H. (French.) **Manufacture and Properties of S.A.P. Sintered Aluminum Powder.** *Journal du Four Electrique,* V. 63, no. 3, May-June 1954, p. 77-78.

Advantages of S.A.P. over aluminum alloys. (H11, Q general, Al)

125-H. (German.) **Preparation of Sintered Chromium-Nickel Steels.** F. Benesovsky and F. Moser. *Plansee-berichte für Pulvermetallurgie,* v. 2, no. 1, June 1954, p. 20-23.

Description of procedure. Graph, tables. 7 ref. (H general, AY)

126-H. (Russian.) **Properties of Metalloceramic Materials Formed by Extrusion.** A. S. Fialkov and Ia. S. Umanskii. *Doklady Akademii Nauk SSSR,* v. 96, no. 6, June 21, 1954, p. 1213-1216.

Relation between flow properties and type of plasticizer. Effect of forming pressure on fired porosity. Table, graphs, diagram. 10 ref. (H11, Cu)

127-H. Now—Piston Rings From Powdered Iron. *Business Week,* 1954, no. 1303, Aug. 21, p. 90-92, 94.

Process, experimentation and pilot production and advantages. Photographs. (H general, Fe, T7)

128-H. Develop New Source for Electrolytic Iron Powder. R. N. Okuno and L. H. Mott. *Iron Age,* v. 174, Aug. 19, 1954, p. 132-133.

Converted byproduct from new pure electrolytic sheet iron process suitable for production of high-density, high-strength parts. Tables. (H10, Fe)

129-H. Effect of Powder Particle Size Upon Behavior of Sintered Iron in Nitriding. W. Köster and J. Raffelsieper. *Henry Brutcher, Altadena, Calif., Translation no.* 3093, 13 p. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 5-6, 1952, p. 225-228.)

Previously abstracted from original. See item 88-H, 1952. (H15, Q29, R general, G17, Fe)

130-H. Some Properties of Iron Powders Produced by Atomization. V. I. Prosvirin and A. F. Silaev. *Henry Brutcher, Altadena, Calif., Translation no.* 3296, 7 p. (From *Vestnik Mashinostroeniya,* v. 33, no. 9, 1953, p. 59-61.)

Effects of atomizing iron powders for composition, particle size and tensile strength of sintered specimens. Tables, graphs, micrographs. (H10, H11, Q23, Fe)

131-H. (German.) **Silicides as Highly Heat Resistant Materials.** R. Kieffer, F. Benesovsky and C. Konopicky. *Berichte der deutschen keramischen Gesellschaft,* v. 31, no. 7, July 1954, p. 223-230.

History, preparation, properties and uses of silicides of the transition metals of groups IV to VI of the periodic table. Phase diagrams, tables, photographs, graphs. 34 ref. (H general)

132-H. (Russian.) **Antifriction Metal-Ceramic Material.** V. I. Likhtman. *Vestnik Akademii Nauk SSSR,* 1954, no. 7, July, p. 50-52.

Process of sintered porous iron-graphite bearings. (H15, Fe)

133-H. Particle Size Distribution Analyzed Quickly, Accurately. F. S. Eadie and R. E. Payne. *Iron Age,* v. 174, Sept. 2, 1954, p. 99-102.

New instrument determines distribution of particle sizes from 1 to 250 microns for use in powder metallurgy, ceramics, abrasives, powder cutting and air pollution control. Diagrams. (H11)

134-H. High Temperatures: Materials. Pol Duwez. *Scientific American,* v. 191, Sept. 1954, p. 98 + 5 pages.

Properties and applications of cermets. Photographs, diagram, micrographs. (H general)

135-H. (Russian.) **New Types of Electrical Ceramics.** N. P. Bogoroditskii, N. L. Poliakova, G. K. Kirillova and A. M. Eidel'kind. *Elektrichestvo,* 1954, no. 7, July, p. 56-60.

Dielectric and mechanical properties, structures and compositions and applications of metal-ceramic materials. Tables, photographs. (H general, P15, Q general, Al, Zr, Ti, Mg, Ba)

136-H. Industrial Diamond Substitutes. I. Physical and X-Ray Study

of Hafnium Carbide. Perry G. Cotter and J. A. Kohn. *American Ceramic Society, Journal,* v. 37, Sept. 1954, p. 415-420.

Data, gathered in process of preparing hafnium carbide, evaluated as a potential industrial diamond substitute. Tables, graph, micrographs. 14 ref.
(H general, T6, Hf, C-n)

137-H. Research and Development in the Field of Carbides, Nitrides, Silicides, and Borides for Aircraft Propulsion. A Status Report. Lloyd D. Richardson, Sr. *Electrochemical Society, Journal,* v. 101, Sept. 1954, p. 222C-224C.

Review of Air Force research. Chief problem is impact resistance and attempts to get a better "fit" thermal expansion-wise between the carbide phase and the metal-binder phase. (H general)

138-H. Metal Carbides. H. D. Carter. *Metal Industry,* v. 85, Aug. 13, 1954, p. 123-125.

Development, preparation, characteristics and applications.
(H general, C-n)

139-H. (Polish.) **Sintered Permanent Magnets. II. Sintered Magnets Containing Aluminum and Cobalt.** W. Rutkowski, *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 3, p. 133-141.

Production method and magnetic properties. Diagrams, graph, micrographs, tables. 6 ref.
(H general, P16, SG-n)

140-H. (Polish.) **Alsifers-Soft Magnetic Cores of Fe-Si-Al Powders.** H. Rutkowska and B. Winsch. *Prace Instytutow Ministerstwa Hunictwa,* v. 6, no. 3, 1954, p. 149-156.

Effects of composition, annealing conditions and processing variables on magnetic properties. Micrograph, graphs, tables. 6 ref.
(H general, P16, SG-n)

141-H. Self-Diffusion and Viscous Flow (Sintering and Creep) of Compacted Metal Powders. Ya. E. Geguzin, L. O. Markon and B. Y. Pines. *Henry Brutcher, Altadena, Calif., Translation no.* 3362, 9 p. (From *Doklady Akademii Nauk SSSR,* v. 87, no. 4, 1952, p. 577-580.)

Fundamentals of diffusional movement of atoms under externally applied pressure. Shrinkage of powdered iron specimens under pressure and in absence of pressure. Calculation of coefficients of self-diffusion and activation energy for self-diffusion. Graphs. 3 ref. (H11, N1, Fe)

142-H. Sintered Nickel-Copper Alloys (Monel). F. Benesovsky. *Henry Brutcher, Altadena, Calif., Translation no.* 3363, 6 p. (From *Metall,* v. 7, nos. 21-22, 1953, p. 894-895.)

Previously abstracted from original. See item 26-H, 1954.
(H15, Ni, Cu)

143-H. (German.) **Lead as an Aid in the Powder Metallurgical Production of Tungsten Tubes.** Wilhelm Hofmann and Wolfgang Scheel. *Zeitschrift für Metallkunde,* v. 45, no. 8, Aug. 1954, p. 512-513.

Pressure sintering of tungsten tubes between a lead coated core and a lead tube. Properties of the tubes. Table, diagrams, graph, photograph. 2 ref. (H15, W)

144-H. (Pamphlet.) **Investigation of the Bonding of Silicon Carbide by Metals.** Report no. PB111415. 33 p. 1953. Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00.

Mechanism in bonding of cermets. Iron and a mixture of chromium and molybdenum are promising materials for binding silicon carbide.
(H12, C-n)

145-H. Powder Metallurgy. *Iron Age,* v. 174, Sept. 30, 1954, p. 73 + 25 pages.

Production economies, press design trends, hot coining methods, sintering problems, plating techniques, high-density parts and part case histories. Photographs, micrographs, graph. 9 ref. (H general)

146-H. Cemented Carbides: Wear Resistance Uses Grow. F. J. Lennon. *Iron Age,* v. 174, Oct. 14, 1954, p. 142-144.

Cost reduction permits extended applications. Photographs.
(H general, Q9, T general, C-n)

147-H. Hot Pressing, Press Forming Loom as Answers to Titanium Fabrication. H. W. Dodds and G. F. Davies. *Journal of Metals,* v. 6, Oct. 1954, p. 1116-1118.

New process powders titanium and keeps gaseous and metallic impurities at minimum. Product now produced by comminuting commercial grade of ductile titanium sponge. Photographs, graphs, table. 4 ref. (H14, Ti)

148-H. Powder Metallurgy Takes Its Place in Industry. Robert Talmage. *Mechanical Engineering,* v. 76, Oct. 1954, p. 817-820.

Advantages and savings from rapidly growing methods of producing metal precision parts. Photographs, table. (H general)

149-H. Sintering Metal Powder Compacts. P. F. Hancock. *Metal*

Industry, v. 85, Sept. 17, 1954, p. 225-228.

Processes, equipment and atmospheres used in powder metallurgy. Photographs, diagram. (H15, Cu, Fe)

150-H. Manufacture of Sheet From Metal Powder. W. D. Jones. *Metal Treatment and Drop Forging,* v. 21, Sept. 1954, p. 421-424, 430.

Iron and copper powder metallurgy, rolling, economics, powder flame spraying. Photographs. (H general, Fe, Cu)

151-H. Powder Metallurgy. *Precision Metal Molding,* v. 12, Oct. 1954, p. 50-54.

Outline to aid designers and buyers understand special features of the process. Photographs. (H general)

152-H. Hot Pressing of Copper Powders. R. Palme. *Henry Brutcher, Altadena, Calif., Translation no.* 3351, 9 p. (From *Metall,* v. 8, nos. 9-10, 1954, p. 369-371.)

Previously abstracted from original. See item 95-H, 1954. (H14, Cu)

153-H. (French.) **Some Possibilities of Powder Metallurgy in the Field of Aeronautics.** Nguyen Thien-Chi. *Métaux, Corrosion-Industries,* v. 29, nos. 347-348, July-Aug. 1954, p. 269-291.

Use of refractory metals, heavy alloys, titanium, cermets, porous bearings, electric contacts, magnetic materials and semiconductors. Photographs, tables, charts. (H general, T24, W, Mo, Ta, Ni, Cu, Ti)

154-H. (German.) **Recent Development of Hard Metals.** Alfred Merz. *Metallurgie und Giessereitechnik,* v. 4, no. 8, Aug. 1954, p. 342-348, 353.

Structure and properties of hard components and bonding metals. Recent advances made to increase toughness, hardness, wear resistance and scaling resistance with and without cobalt. Tables, diagrams, micrographs, graphs. 35 ref. (H general, Q23, Q29, R2, C-n, Co)

155-H. (Italian.) **Sintering Advantages and Limitations.** Neri Corsini. *Metallurgia italiana,* v. 46, nos. 7-8, July-Aug. 1954; *Atti notizie (AIM),* v. 9 nos. 7-8, July-Aug. 1954, p. 209-211, 225.

Raw materials, equipment, depreciation and other processing costs. Table. (H15)

156-H. (Polish.) **Production of Zirconium Powder by Magnesium-Thermal Method.** W. Rutkowski. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 4, 1954, p. 176-183.

Method produces zirconium of 92% purity from zircon. Tables, graphs, diagrams, micrographs. 11 ref. (H10, Zr)

157-H. (Polish.) **Iron Powder for Mass Products Obtained From Mill Scale Reduced by Hydrogen and Carbon.** B. Razumowski. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 4, 1954, p. 188-199.

Use of hydrogen resulted in powder of 99% purity; purity was 97 to 98% when the scale was reduced by coal. Tables, micrographs, diagrams, graphs. (H10, Fe)

158-H. Chromium-Nickel Alloy Steel Powders for High Strength Parts. E. Gordon, W. V. Knopp and J. D. Shaw. *Materials & Methods,* v. 40, Oct. 1954, p. 107-109.

Properties and applications of prealloyed chromium-nickel powders when added to low-cost reduced iron powders produce strong and wear resistant products for pressing and sintering. Tables, micrographs. 1 ref. (H12, AY, Fe)

159-H. High Strength Steel Parts Produced by a New Powder Metallurgy Process. John W. Young. *Precision Metal Molding,* v. 12, Nov. 1954, p. 48-51, 89-92.

Details of new process, properties of typical parts. Table, graphs, photographs, micrographs. (H general, ST)

160-H. Corrosion Resistant, Iron-Base Metal Powder Products. N. I. Moskvin. *Henry Brutcher, Altadena, Calif., Translation no.* 2967, 7 p. (From *Vestnik Mashinostroeniya,* v. 32, no. 3, 1952, p. 73-76.)

Production and properties, simultaneous sintering and chromizing of iron-powder compacts. Tables, graphs, photographs, micrographs, diagrams. (H general, Fe, Cr)

161-H. Regularities in the Compacting of Copper-Graphite Powders. T. N. Znatokova and V. I. Likhtman. *Henry Brutcher, Altadena, Calif., Translation no.* 3382, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 96, no. 3, 1954, p. 577-580.)

Previously abstracted from original. See item 118-H, 1954. (H11, Cu)

SECTION J

HEAT TREATMENT

1-J. The Bright Annealing of Copper and Its Alloys. W. C. F. Hessenburg and E. C. Mantle. *Metal Industry,* v. 83, Oct. 16, 1953, p. 323-324; Oct. 30, p. 363-364.

Process, including use of controlled atmospheres. 4 ref. (To be continued.) (J23, Cu)

2-J. (French.) **Surface Hardening of Steel by Means of High Frequency Induction Heating.** G. Perronne. *Chaleur & Industrie,* v. 34, no. 339, Oct. 1953, p. 279-290.

Theoretical and practical aspects of the method, details of the process and equipment necessary. Results are compared with previous data. Photographs, graphs. 28 ref. (J28, J2, ST)

3-J. 60-Cycle Induction Heating. *Factory Management and Maintenance,* v. 111, Nov. 1953, p. 111-113.

Applications and presents advantages and limitations in heat treating and forging operations on aluminum. (J2, F21, Al)

4-J. Whiteheart Malleable Annealing. *Foundry Trade Journal,* v. 95, Oct. 29, 1953, p. 537-538.

Heat treating process and its advantages. Photograph, table. (J23, CI)

5-J. Strict Gas Control Halts Decarb in Aircraft Tubing. W. D. Latiano. *Iron Age,* v. 172, Nov. 19, 1953, p. 154-157.

Annealing and normalizing operations resulting in practically no surface carbon loss. Photographs, graph, table, micrographs. (J23, J24, CN)

6-J. The Bright Annealing of Copper and Its Alloys. W. C. F. Hessenberg and E. C. Mantle. *Metal Industry,* v. 38, Oct. 30, 1953, p. 363-364.

Recuperative radiant tube and open-flame annealing furnaces. (J23, Cu)

7-J. Flame Hardening With Natural Gas. *Western Machinery and Steel World,* v. 44, Nov. 1953, p.119-120.

Technique. Application is practical when natural gas is mixed in proper proportion with oxygen. Photographs. (J2)

8-J. (German.) **The Age-Hardening of Thin Films of Al-Ag Alloys.** A. Winkelmann and H. Raether. *Naturwissenschaften,* v. 40, no. 20, 1953, p. 526.

Study of precipitation hardening of vapor-deposited aluminum-silver alloy with electron interferences. Results indicate that thin films reach the stable gamma phase more readily than thicker layers of the alloy because of the absence of internal stresses. Diagram. 6 ref. (J27, Al, Ag)

9-J. Fuel Selection for Heat Treating at Caterpillar. Glen C. Riegel and Thomas Spencer. *Industry and Power,* v. 65, Nov. 1953, p. 72-75.

Factors governing choice of gas or electricity. Photographs. (J general)

10-J. Gas Carburizing—From Pioneer to Practical Production. John T. Mitchell and Russell Buyea. *Industrial Gas,* v. 32, Nov. 1953, p. 3-5, 24.

Method resulting in reduced costs, improved quality of production and better working conditions. Photographs. (J28)

11-J. Production Normalizing of Steel Forgings at Allison Engine Division. *Industrial Heating,* v. 20, Nov. 1953, p. 2164-2166, 2168, 2170.

Includes photographs. (J24)

12-J. An Evaluation of the Hardening Power of Quenching Media for Steel. II. Earl J. Eckel, Ross M. Mayfield, Glen W. Wensch and Frank A. Rough. *Industrial Heating,* v. 20, Nov. 1953, p. 2192, 2194, 2196, 2198, 2200, 2202, 2204, 2206.

Jominy end-quench hardenability test and results of water, brine, oil and air quenches. Graphs, tables, diagrams, photograph. (To be continued.) (J26, J2)

13-J. Selective Flame Hardening Improves Camshaft Wear Resistance. W. G. Patton. *Iron Age,* v. 172, Nov. 12, 1953, p. 171-174.

Automatic unit and its advantages of versatility, safety, high production and close control. Photographs. (J2)

14-J. The Bright Annealing of Copper and Its Alloys. W. C. F. Hessenberg and E. C. Mantle. *Metal Industry,* v. 83, Nov. 6, 1953, p. 377-380.

Construction of annealing furnaces and effects of atmosphere composition and residual rolling lubricants on surface finish. Photographs, diagrams. 19 ref. (J23, Cu)

15-J. Measurement of Case Depth. Dale J. Wright. *Metal Progress,* v. 64, Dec. 1953, p. 86-88.

Equipment and procedures for a rapid, reliable, low-cost test. Standard specimens are used with direct reading microscope. Photographs. (J28, CN)

16-J. Controlled Atmospheres. Their Generation and Utilization. O. E. Cullen. *Metal Progress,* v. 64, Dec. 1953, p. 101-106.

Composition and uses of atmospheres for various heat treating operations. (J2, ST)

17-J. (Czechoslovakian.) **Heat Treatment as a Characteristic Factor of Carbon and Alloyed Structural Steels.** *Hutnické Listy,* v. 8, no. 10, Oct. 1953, p. 521-528.

Favorable effects of fast cooling on mechanical properties, aging resistance and weldability. Graphs, table. 8 ref. (J26, J27, CN, AY)

18-J. (Czechoslovakian.) **Methods of Study and Control of Heat Treatment of Steel.** Ladislav Jenicek and Bohdan Sestak. *Hutnické Listy,* v. 8, no. 10, Oct. 1953, p. 512-521.

Magnetic measurements. Methods for determining the beginning of martensite transformation. Diagrams, graphs. 25 ref. (J general, N8, ST)

19-J. (Book.) **Hardenability of Cast Steel.** Naval Research Laboratory. 37 p. Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25. Photostat $5.00.

Tests indicate that within the usual limits of accuracy, hardenability factors established for forged steel apply to cast steel if allowance is made for presence of carbide formers. (J26, CI)

20-J. (Book—German.) **(A Collection of Articles on Hardening Technology) Härterei-technische Mitteilungen.** P. Riebensahm, editor, v. 5, 283 p. 1952. Carl Hanser Verlag, Munich 27, Germany. DM.24.00.

Twelve previously unpublished papers deal with wide range of topics relative to steel heat treating and various surface hardening processes. (J26, J28)

21-J. Electric Spark-Hardening of Tools. L. Y. Popilov. *Engineers' Digest,* v. 14, Nov. 1953, p. 424-425. Translated from *Stanki i Instrument,* no. 5, 1953, p. 17-19.

Method and theory. Diagram, tables. (J2, TS)

22-J. Annealing or Softening Improves Gray Iron Machinability. Charles O. Burgess. *Foundry,* v. 81, Dec. 1953, p. 108-111, 250.

Mechanism of annealing and recommended annealing temperatures and times. Photographs, graphs, micrographs. 10 ref. (To be concluded.) (J23, G17, CI)

23-J. Heat Treatment of Steel Castings. John Howe Hall. *Foundry,* v. 81, Dec. 1953, p. 126-129, 194.

Jominy test and effect of quenching and tempering. Graphs, tables, micrographs. 10 ref. (J26, CI)

24-J. Integrated Heat Treating and Machining Setup Triples Production. A. A. Fisk. *Iron Age,* v. 172, Dec. 3, 1953, p. 174-176.

Equipment, plant layout and operating procedures. Photographs. (J general, G17)

25-J. Applying Electric Heat. Leo F. Spector. *Machine Design,* v. 25, Dec. 1953, p. 142-158.

Basic considerations in analysis, selection and application of built-in units for effective heat control. Graphs, photographs, tables. (J2)

26-J. Carbo-Nitriding and Gas Hardening. R. H. Warring. *Machinery Lloyd (Overseas Ed.),* v. 25, Nov. 21, 1953, p. 70-73.

Method of hardening which combines advantages of carburizing and nitriding. Graphs, tables. (J28)

27-J. Bright Annealing. *Metal Industry,* v. 83, Nov. 20, 1953, p. 423-424.

Modern bell-type annealing furnace with heat recuperations. Photographs, diagrams. (J23)

28-J. (French.) **Nitrided Casting.** *Fonderie,* 1953, Oct., no. 93, p. 3655-3656.

Standards of casting compositions, thermic processes before nitriding and the nitriding process. Tables. 5 ref. (J28, AY, Cr, Al, Mo)

29-J. (German.) **The Work of an Induction-Hardening Plant.** K. Flick. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 95, no. 31, Nov. 1, 1953, p. 1061-1065.

Process and advantages of induction hardening. Practical data and materials suitable for the process. Photographs, table, diagrams. 8 ref. (J2, Mn, Si, Cr, Mo, V)

30-J. (Hungarian.) **Metallographic Phenomena of Tempering and High-Speed Tempering.** Ferenc Boda. *Ontöde,* v. 4, no. 11, Nov. 1953, p. 238-243.

Investigations. Micrographs illustrate various structures. Tables. 9 ref. (J29, M27, CI, AY)

31-J. (Russian.) **Cold Hardening of Metal in a Static-Stressed State.** D. A. Sveshnikov and A. M. Tarasov. *Vestnik Mashinostroeniia,* v. 33, no. 8, Aug. 1953, p. 67-70.

Studies of residual stresses from compression and direct hardening of surface layers; importance of each. Graphs, photographs. 5 ref. (J26, Q25)

32-J. Annealing or Softening Improves Gray Iron Machinability. Charles O. Burgess. *Foundry,* v. 82, Jan. 1954, p. 110-113.

Methods of annealing and their effect on properties of gray iron. Photographs, tables, graphs. 7 ref. (J23, G17, CN)

33-J. Savings by the Tank Car. Paul E. Peacock, Jr. *Industry and Power,* v. 65, Dec. 1953, p. 64-69.

Bright annealing operation. Information and cost comparisons can be used for all applications which require equivalent amounts of ammonia. Photographs, tables, graphs. (J23)

34-J. Sinews for the Stratojets. S. G. Andrews and H. H. Smith. *Instrumentation,* v. 7, no. 1, 1953, p. 4-7.

Heat treating operations to insure desired tensile strength and corrosion resistance of aluminum alloy parts used in medium bombers. Photographs, micrographs. (J general, Q23, R general, Al)

35-J. Nitriding Critical Steel Parts. Ralph Spagnola. *Materials & Methods,* v. 38, Dec. 1953, p. 96-97.

Improvement of core strength by heat treatment and surface hardening by nitriding resulting in increased wear resistance, fatigue strength and bearing properties. Photographs. (J28)

36-J. Sulphurized Surfaces Resist Wear and Seizure. Bernard Jousset. *Metal Progress,* v. 65, Jan. 1954, p. 76-80.

Production of superior wear resistance on cast iron and steel engine parts by a heat treatment which adds a considerable amount of sulfur to the surface. Graphs, diagram. (J28, CI, CN)

37-J. Developments in German Constructional Steels to Conserve Scarce Alloys. F. W. Bruhl. *Metal Progress,* v. 65, Jan. 1954, p. 97-100.

Hardenability and machinability of carburizing and heat treating steels. Data on nickel-chromium, chromium-manganese and triple-alloy steels. Graphs, diagram, table. (J26, G17, AY)

38-J. (Czechoslovakian.) **Heat Treatment of Gears by the AC1 Surface Hardening Process.** F. Poboril. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 450-454.

Method consists of isothermic hardening of gears made from practically eutectic low alloy steels after heating in a salt bath. Tables, graphs. 4 ref. (J28, J2, AY)

39-J. (Czechoslovakian.) **Control of Heat Treatment in Large Forgings.** Stanislav Burda and Jaroslav Ruzicka. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 454-460 + 2 plates.

Methods of measuring temperatures and testing of the sample. Tables, graphs, photographs, diagrams. 7 ref. (J general, S16, ST)

40-J. (Czechoslovakian.) **Heat Treatment of Tool Steels.** Rudolf Stefec. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 461-464.

Principles and ways of preventing distortion. Effects of residual austenite content. Graphs. (J general, TS)

41-J. (Czechoslovakian.) **Treatment of Tool Steels Below Freezing Point.** Otakar Moravek. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 464-470.

Experimental results and possibility of using method for other steels. Table, graphs, photographs, micrographs. 7 ref. (J2, TS)

42-J. (Czechoslovakian.) **Induction Heating of Rolled Pieces.** Emil Langer. *Hutnické Listy,* v. 8, no. 9, Sept. 1953, p. 470-475.

Selection of suitable frequency and heating time. Diagrams, graphs, tables. 4 ref. (J2)

43-J. (French.) **Study of Some Low-Alloy Steels Quenched Normally and**

in Stages. G. Delbart and F. Maratray. *Revue de métallurgie,* v. 50, no. 11, Nov. 1953, p. 781-806.

Studies of specimens of Mn-Si, Cr-Mn-Si and Cr-V steels quenched in oil and tempered and quenched isothermally. Mechanical properties and Jominy hardenability of these steels compared with those of more highly alloyed Cr-Mo and Ni-Cr-Mo steels. Tables, graphs. 3 ref. (J26, Q general, AY)

44-J. (Hungarian.) **Gaseous Annealing of Malleable Castings.** Elek Chapo. *Ontöde,* v. 4, no. 8, Aug. 1953, p. 165-170.

Various reactions involved in annealing white cast iron. Effect of gas atmosphere upon decarburation and graphitization, influence of hydrogen in furnace atmosphere and effect of manganese-sulfur ratio of iron upon annealing rate. Table, graphs. (To be continued.) (J23, CI)

45-J. Automatic Furnace Line for Heat Treating Aircraft Screws. *Automotive Industries,* v. 109, Dec. 15, 1953, p. 39, 132.

Equipment, plant layout and operating procedures. Photographs. (J general)

46-J. Continuous Carburizing and Hardening of Pinions and Gears at Ford. *Industrial Heating,* v. 20, Dec. 1953, p. 2370-2372, 2374-2376, 2378.

Continuous furnace and quenching, annealing, and stress relieving operations. Photographs. (J28, J23, J1, ST)

47-J. An Evaluation of the Hardening Power of Quenching Media for Steel. III. Earl J. Eckel, Ross M. Mayfield, Glen W. Wensch and F. A. Rough. *Industrial Heating,* v. 20, Dec. 1953, p. 2392, 2394, 2396, 2398, 2518.

Results for an adaptation of the end-quench test to still-quenching conditions using oil and brine. Photograph, diagrams, graphs. (J2, J26, ST)

48-J. Continuous Heat Treatment of Non-Ferrous Strip by Transverse Flux Induction Heating. I. Robert M. Baker. *Industrial Heating,* v. 20, Dec. 1953, p. 2402, 2404, 2406, 2408, 2410, 2412.

Method and its advantages over longitudinal flux heating. Diagrams. (To be continued.) (J2, EG-a)

49-J. How to Determine Quenching-Distortion Properties. J. E. Campbell and H. O. McIntire. *Iron Age,* v. 172, Dec. 17, 1953, p. 140-143.

Favorable stresses improve fatigue life. The greater the stresses the more the distortion. Water quenching produces higher stresses and more warpage than oil. Minimum distortion is obtained on steels with just enough hardenability to harden through. Graphs, diagram, tables, photograph. (J26, Q7, ST)

50-J. Heat Treatment of Aluminum Casting Alloys. H. J. Rowe and W. E. Sicha. *Metal Treating,* v. 4, Nov.-Dec. 1953, p. 2-5, 34, 37.

Furnaces, temperature control, annealing, precipitation hardening and aging. Micrographs, tables, graphs. 9 ref. (J general, Al)

51-J. Conveyorized Hardening Furnaces. A. J. Jarema. *Metal Treating,* v. 4, Nov.-Dec. 1953, p. 6-7, 30.

Equipment, plant layout and operating procedures. Photographs, diagram. (J26)

52-J. Pusher-Chain Conveyor Combined in Semi-Continuous Production Unit. H. N. Ipsen, *Metal Treating,* v. 4, Nov.-Dec. 1953, p. 8-9.

Semi-continuous, controlled atmosphere heat treating furnaces. Diagram, photograph. (J general)

53-J. Machined Parts and Their Dimensional Control in Heat Treatment. I. H. Boyer, *Modern Machine Shop,* v. 26, Jan. 1954, p. 120-129.

Methods of minimizing distortion and volume changes in steel. Sketches, micrographs. (To be concluded.) (J general, P10, ST)

54-J. Andrew Laing Lecture. Internal Stresses in Some Types of Forging. C. Sykes. *North East Coast Institution of Engineers & Shipbuilders, Transactions,* v. 70, Dec. 1953, p. 61-92.

Considerations in selection of heat treatment cycles to produce shaft forgings. Tables, diagrams, graphs. 12 ref. (J1, F22, CN, AY)

55-J. Inside Look at Hardening Cast Iron. John Obrebski. *Steel,* v. 133, Dec. 28, 1953, p. 71-73.

Hardenability of cast iron depends on analysis, structure, and as-cast hardness plus stability of pearlite. For high quality, watch these and the heat treat process. Micrographs, photograph. (J26, CI)

56-J. Continuous Annealing With Carbon Restoration of Coils and Bars. J. D. Armour. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1305-1309, 1359.

Methods of annealing with prepared atmospheres and carbon restoration. Photographs, micrographs, graph. (J23)

57-J. (Hungarian.) **Annealing in a Gaseous Atmosphere. II.** Elek Chapo. *Ontöde,* v. 4, no. 9, Sept., p. 185-189.

Structure and operation of annealing furnaces. Advantages of annealing in a gaseous atmosphere. Diagrams, table. 9 ref. (J23)

58-J. (Book.) **Electric Resistance Heating.** 182 p. British Electrical Development Association, 2, Savoy Hill, London W.S. 2, England. 8s. 6d.

Advantages offered by electric heating, fundamental principles, and control methods. Resistance furnaces, salt baths, and ovens. Soft-metal melting, liquid heating, platen heating, steam raising, and miscellaneous applications such as soldering and air heating. (J2, E10, K7)

59-J. Carbo-Nitriding. *Automobile Engineer,* v. 43, Dec. 1953, p. 550-552.

A new Birlec controlled-atmosphere furnace for light-case work. Photographs, diagrams. (J28)

60-J. Elevator Furnaces at Gloucester Foundry for Blackheart Malleable. P. F. Hancock. *Foundry Trade Journal,* v. 95, Dec. 10, 1953, p. 733-736.

Equipment, plant layout and operating procedures. Photographs, diagrams, graph, table, micrographs. 4 ref. (J23)

61-J. Induction Heating: Low Frequencies Have Advantages. J. A. Logan. *Iron Age,* v. 172, Dec. 24, 1953, p. 69-72.

Induction heating can be used in applications previously considered impractical because of the cost of high-frequency motor generator sets. Photographs. (J2)

62-J. Hot Oil Quenching Toughens Tractor Shovel Parts. R. H. Marshall. *Iron Age,* v. 172, Dec. 31, 1953, p. 67-71.

Improve service life of gears by quenching in hot oil. Photographs, diagram. (J26)

63-J. Heat Treatment and Assembly Operations in Tractor Gearbox Production. *Machinery (London),* v. 83, Dec. 18, 1953, p. 1197-1199.

Includes photographs. (J general)

64-J. Investigations on Annealing of Steels From Hot-Working Temperature With Isothermal Transformation. E. Theis. Henry Brutcher, Altadena, Cal., Translation no. 3032, 13 p.; disc., p. 13-17 + 3 plates. (Condensed from *Stahl und Eisen,* v. 71 no. 26, 1951, p. 1433-1438; disc., p. 1438-1440.)

Previously abstracted from original. See item 64-J, 1952. (J23, N8, ST)

65-J. Annealing and Tempering of Steel Bars in an Induction Heat Treating Plant on Line Frequency. H. Krainer, M. Kroneis, and F. Raidl. Henry Brutcher, Altadena, Cal., Translation no. 3038, 13 p. + 2 plates. (From *Stahl und Eisen,* v. 71, no. 17, 1951, p. 880-886.)

Previously abstracted from original. See item 290-J, 1951. (J2, Q general, ST)

66-J. Nitriding of Austenitic Steels. K. S. Khomenko. Henry Brutcher, Altadena, Cal., Translation no. 3047, 7 p. (From *Vestnik Mashinostroeniya,* v. 32, no. 3, 1952, p. 71-72.)

Difficulties encountered in nitriding of austenitic steels and ways in which they may be overcome. (J28, ST)

67-J. On the Hardening of Steel, With Special Reference to Transformation Kinetics. F. Wever. Henry Brutcher, Altadena, Cal., Translation no. 3059, 19 p. + 1 plate. (Condensed from *Stahl und Eisen,* v. 69, no. 19, 1949, p. 664-670.)

Previously abstracted from original. See item 18B-203, 1949. (J26, N8, ST)

68-J. Investigations Into the Spheroidizing of Plain Carbon and Low Alloy Steels. S. Ammareller. Henry Brutcher, Altadena, Cal., Translation no. 3083, 20 p. + 1 plate. (From *Stahl und Eisen,* v. 70, no. 11, 1950, p. 459-463.)

Previously abstracted from original. See item 164-J, 1950. (J23, N8, CN, TS)

69-J. (Dutch.) **Heating With High-Frequency Energy.** A. de Vries. *Bedrijf en Technick,* v. 8, no. 189 (24); Electronica section, v. 6, no. 136, Nov. 21, 1953, p. 185-187.

Heating metals by high-frequency induction method. Diagrams. (J2)

70-J. (Dutch.) **Hardenability of Steel.** F. Van Wijk. *Metalen,* v. 8, no. 22, Nov. 30, 1953, p. 401-406.

A concise survey presented on theory of depth of hardening of steel. Hardenability, severity of quench and dimensions of quenched piece as factors controlling depth of hardening. Graphs, tables, photograph. 6 ref. (J26, ST)

71-J. (German.) **Machines for the Induction Hardening of Surfaces.** E. Höhne. *Elektrotechnische Zeitschrift,* v. 5, Ausgabe B, no. 11, Nov. 21, 1953, p. 359-363.

Principle of process and machines operated with average and high-frequency current. Graph, photographs, diagram. 4 ref. (J2)

72-J. (Norwegian.) **Surface Hardening of Steel.** Sigge Hähnel. *Teknisk Ukebald,* v. 100, no. 45, Dec. 3, 1953, p. 970-975.

Survey surface hardening methods. (J28, ST)

73-J. (English.) **The Annealing of Copper After Radiation Damage at Low Temperatures.** R. R. Eggleston. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 679-683.

Up to 80° C., rate of annealing was similar, but at room temperature about 25% of the radiation

damage remained, compared to 50% remaining in the cold worked specimen. Graphs, table, diagram. 8 ref. (J23, Cu)

74-J. Nitriding Produces Better Hard Case on Titanium. J. L. Wyatt and N. J. Grant. *Iron Age,* v. 173, Jan. 14, 1954, p. 112-115.

Nitride hardening with ammonia will improve wear and antigalling properties. Graphs, micrographs, table. (J28, Ti)

75-J. The Design and Construction of Inductors. D. Warburton-Brown. *Mechanical World and Engineering Record,* v. 134, Jan. 1954, p. 11-19.

Practical design of coils to suit a variety of workpieces. Some useful notes on making coils. Diagrams, photographs, graph. (J2)

76-J. Bright Annealing Copper Strip. *Metal Industry,* v. 84, Jan. 8, 1954, p. 32.

Equipment and processes. Photographs. (J23, Cu)

77-J. Heat-Treatment of High-Speed Steel. I. Introduction and General Outline of Techniques. S. G. Cope. *Metal Treatment and Drop Forging,* v. 21, Jan. 1954, p. 3-10.

Development of high speed steels. Standard hardening treatments. Some factors influencing final microstructure and properties of the steel. Graphs, photomicrographs. 10 ref. (J26, M27, TS)

78-J. (Russian.) **Carburizing of Steel by Natural Gas.** G. I. Pogodin-Alekseev and G. V. Zemskov. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 65-68.

Composition of the gas and carburizing temperature. Graphs. 3 ref. (J28, ST)

79-J. (Russian.) **Influence of Chromium and Manganese Concentration in the Metallic Phase on the Annealing Ability of Toolsteel.** V. V. Polovnikov. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 68-70.

Specimens of 24 melts were tested. Table, graphs. (J23, TS)

80-J. (Russian.) **Means of Obtaining Deep Low-Temperature Gas Cyanidation.** E. N. Druzhinina. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 70-73.

Confirms positive influence of preliminary electrochemical cleaning of parts and of aluminum chip introduced into the muffle furnace at 550 to 600° C. Tables, micrographs. 6 ref. (J28, L13, TS)

81-J. Effect of Prebaking in Malleablizing Iron. Floyd Brown. *American Foundryman,* v. 25, Feb. 1954, p. 50-51.

Prebaking hard iron forms graphite nuclei. This does not require hydrogen which, in fact, inhibits the prebaking effect. Graph, table. 6 ref. (J23, CI)

82-J. High-Temperature High-Vacuum Furnace. H. W. Davidson and T. H. Burwood. *Engineering,* v. 177, Jan. 22, 1954, p. 106-108.

Simple design for heat treatment up to 2200° C. Photographs, graph, diagrams. 6 ref. (J2)

83-J. Continuous Heat Treatment of Non-Ferrous Strip by Transverse Flux Induction Heating. II. Robert M. Baker. *Industrial Heating,* v. 21, Jan. 1954, p. 56, 58, 60, 62, 66, 68, 146.

Design and operating experience with transverse flux coils. Photographs. (J2)

84-J. Nitriding Improves Titanium Properties. II. J. L. Wyatt and N. J. Grant. *Iron Age,* v. 173, Jan. 28, 1954, p. 124-127.

Increased hardness, resistance to galling, improved creep rupture properties and better oxidation resistance. Graphs, tables. (J28, Q29, Q3, Q9, R2, Ti)

85-J. Machined Parts and Their Dimensional Control in Heat Treatment. II. Howard Boyer. *Modern Machine Shop,* v. 26, Feb. 1954, p. 132-143.

Dimensional changes produced in machined parts during heat treatment. Graph, photograph, drawings, table. (J general, P10, ST)

86-J. Heat Treatment of Aircraft Parts. Frank Crahen. *Steel Processing,* v. 40, Jan. 1954, p. 48-49, 58.

Equipment and processes for carburizing, hardening and annealing steel parts. Photograph, table. (J28, J27, J23, AY)

87-J. Production Changes at Riverbank. *Western Machinery and Steel World,* v. 45, Jan. 1954, p. 92-94.

Equipment, plant layout and operating procedures for large western spheroidizing plant. Photographs. (J23, CN)

88-J. (English.) **Thermal Annealing of Radiation-Induced Hardness Changes in Alkali Halides.** D. R. Westervelt. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 755-758.

Hardness changes, occurring under conditions where a large number of displacements may be expected, differ markedly in their thermal annealing characteristics from those where damage is largely due to ionization. Graphs. 5 ref. (J23, Q29)

89-J. (French.) **Electric Furnaces With a Controlled Atmosphere.** Marcel Chain. *Journal du Four Electrique,* v. 62, no. 6, Nov.-Dec. 1953, p. 169-175; disc., p. 175-176.

Atmospheres and equipment. Graphs, diagrams, photographs. (J2)

90-J. (Photocopy.) **Development of Titanium-Base Alloys.** P. B. 112227. Wright Air Development Center, U. S. Air Force. 158 p. 1952. Available from Library of Congress, Washington 25, D. C. Microfilm $6.00. Photostat $20.00.

Experiments indicate that it may be commercially possible to solution-treat certain alloys at about 1300° F., machine or form a part, and then age-harden the part to a high strength. These alloys may be stable for extended periods of time at operating temperatures of up to 600° F., thus opening up a whole new field of application for high-strength alloys of titanium. (J27, Ti)

91-J. Heat Treatment of Titanium Generalized in Terms of Beta Prime. Leonard D. Jaffe. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 210.

Guide for practical heat treatment. Graph. 9 ref. (J general, Ti)

92-J. Annealing of a Cold Rolled Aluminum Single Crystal. A. H. Lutts and P. A. Beck. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 257-260.

Experimental procedures and results. Graphs, photographs. 14 ref. (J23, Al)

93-J. Effective Heat Treatment of Molybdenum. T. G. Perry, H. S. Spacil and John Wulff. *Metal Progress,* v. 65, Feb. 1954, p. 75-77.

Temperature and time of annealing to avoid brittleness. Relation to distribution of residual oxygen. Micrographs. (J23, Q23, Mo)

94-J. Dew Point—A Means of Measuring the Carbon Potential of Prepared Atmospheres. Norbert K. Koebel. *Metal Progress,* v. 65, Feb. 1954, p. 90-96, 96B, 172.

Equilibrium relationships between the dew point of endothermic furnace atmosphere and various carbon, alloy and toolsteels. Diagram, table, micrograph, graphs, photograph. (J2, ST)

95-J. (German.) **Spectrographic Determination of Surface Carburization and Decarburization.** Werner Liedtke. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 465-467.

Improved method. Compares results with chemical and microscopic determination. Photograph, micrographs, graph, spectrogram, table. (J28, S11, Fe)

96-J. (German.) **Hardenability of Different Commonly Used Structural Steels According to Jominy End-Quench Test.** Heinz Kiessler and Karl Schweyher. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 475-481.

Divergence in hardness curve due to sampling was shown to be very small indicating reliability of Jominy test. Table, graphs. 10 ref. (J26, AY)

97-J. (German.) **Inductive Surface Hardening of Cast Steel.** G. W. Seulen. *Giesserei,* v. 41, no. 2, Jan. 21, 1954, p. 40-41.

Surfaces of steel heated by induction and quenched can be hardened to depths of 1 to 8 mm. and hardness of Rockwell 55 to 60. 2 ref. (J2, J28, Q29, CI)

98-J. Heat-Treatment of Spheroidal-Graphite Cast Iron. Marcel Ballay, Raymond Chavey and Jacques Grilliat. *Foundry Trade Journal,* v. 96, Feb. 4, 1954, p. 125-128.

Hardening by means of quenching after localized heating and annealing for the relief of internal stresses. Tables, graphs, photograph. 2 ref. (J26, J1, CI)

99-J. The Heat-Treatment of High-Carbon, High-Chromium Tool Steel. J. Lomas. *Machinery Lloyd (Overseas Ed.),* v. 26, Jan. 30, 1954, p. 75, 77-78.

Typical procedure. (J general, TS)

100-J. Carbon Controller for Carburizing and Carbon Restoration. Wayne L. Besselman. *Materials & Methods,* v. 39, Feb. 1954, p. 110-112.

Device for more accurate heat treatment. Photographs, graph. (J28, ST)

101-J. New Surface Hardening Unit Provides Accurate Temperature Control. Joseph H. Bockrath. *Metal Treating,* v. 5, Jan.-Feb. 1954, p. 2-3, 18.

Gas unit that selectively hardens all types of gears, segments and cylinders up to 36 in. diameter. Photographs, micrographs. (J28, ST)

102-J. Facts and Figures on Heat Treating Costs. Horace C. Knerr. *Metal Treating,* v. 5, Jan.-Feb. 1954, p. 4-5, 35.

Small users' operational costs. Table. (J general, A4)

103-J. Propane-Air Gas Standby Plant Protects Output of New Wire Mill. Paul E. Peacock, Jr. *Metal Treating,* v. 5, Jan.-Feb. 1954, p. 6-7, 17.

A gas-fired heat treating plant. Photographs. (J general)

104-J. Furnace Symposium. VII. Continuous Reciprocating Furnaces.

F. C. Schaefer. **VIII. Continuous Roller Hearth Furnace.** A. R. Robertson. *Metal Treating,* v. 5, Jan.-Feb. 1954, p. 8-12, 14.

Construction, operation and advantages. Photographs. (J general)

105-J. Salt Baths. Versatile Performers on the Heat Treating Team. L. B. Rosseau. *Steel,* v. 134, Feb. 15, 1954, p. 108-111.

For heating and cooling metals, the salt bath furnace has a wide field of usefulness. Basic characteristics that back up present-day applications. Photographs, tables, graphs. (J2)

106-J. Induction Preheating and Stress-Relieving for High-Pressure Steam and Water Pipelines. A. Luthy. *Welding and Metal Fabrication,* v. 22, Feb. 1954, p. 64-68.

Equipment and techniques in practice. Photographs, diagram. (J2, J1, CN)

107-J. Precision Furnace Unit Employed for Magnesium Castings to Avoid Distortion, Improve Strength. B. Walker. *Western Metals,* v. 12, Feb. 1954, p. 50-52.

Gas-fired, controlled atmosphere furnace holds temperature uniformity of ±3° F. Photographs, chart. (J2, Mg)

108-J. (Dutch.) **Heat Treating High Speed Steels.** J. C. C. Stegwee. *Metalen.* v. 8, no. 21, Nov. 15, 1953, p. 382-388.

Effect of heat treating time and temperature on microstructures and properties of high speed toolsteels. Photomicrographs, tables, graphs. (J26, TS)

109-J. (Russian.) **Control of Annealing of Malleable Iron by Its Magnetic Properties.** K. P. Zhadnov., *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 29-30.

Compares results with Brinell hardness measurements. Graphs, micrographs, table. (J23, P16, Q29, CI)

110-J. Heat Treating of Aluminum. Edward S. Bunn. *Industrial Heating,* v. 21, Feb. 1954, p. 236-238, 240, 242, 244, 246, 248, 406, 408, 410.

Gas heating operations involved in processing aluminum. Photographs, graphs, photomicrographs, tables. 3 ref. (J general, Al)

111-J. Stress Relieving Furnace at Minimum Investment. Fred M. Burt. *Industrial Heating,* v. 21, Feb. 1954, p. 264, 266, 268.

Furnace for stress-relieving welded structures. Photographs. (J1)

112-J. Industrial Furnaces. *Iron Age,* v. 173, Feb. 25, 1954, p. 111-190.

Survey of latest developments including surface treating and hardening, controlled heating and cooling, sintering, brazing, lower temperatures, enameling, galvanizing and heating for hot forming. Photographs, diagrams, graph, tables. (J28, K8, F21, L27, L16, B16)

113-J. Heat-Treatment of High-Speed Steel. II. Heating High-Speed Steel for Hardening. S. G. Cope. *Metal Treatment and Drop Forging,* v. 21, Feb. 1954, p. 67-74.

Heating process for hardening high speed steel and influence of condition prior to this treatment on final properties. Distribution and nature of carbides and various factors influencing carbide solution and grain size, indicating how mechanical properties are affected by them. Graphs. (J26, Q general, TS)

114-J. Tools for the Heat Treater. A. H. Koch. *Tool Engineer,* v. 32, Mar. 1954, p. 45-53.

Furnaces, furnace equipment and operating procedures including heating cycles, delayed and interrupted quenching and use of protective atmospheres. Photographs, table, diagrams. (J general)

115-J. Commercial Annealing and Quenching Plus Tempering of Cold-Drawn Steel Bars With Special Consideration of Scaling, Decarburization, Heating Rate and Temper Brittleness. I. Annealing Before and After Cold Drawing. W. Hülsbruch. *Henry Brutcher, Altadena, Calif., Translation no.* 2570, 19 p. (From *Stahl und Eisen,* v. 70, no. 15, 1950, p. 641-647.)

Previously abstracted from original. See item 220-J, 1950. (J23, J29, ST)

116-J. Protection of Hot Work Tools in Heat Treatment. J. Y. Riedel. *Metal Progress,* v. 65, Mar. 1954, p. 85-87.

System where steels can be hardened in uncontrolled atmospheres by copper plating, protecting copper plate during heating by packing in a material which has a carburizing potential. Photograph, table. (J26, TS)

117-J. Surface Hardening Processes for Titanium and Its Alloys. R. W. Hanzel. *Metal Progress,* v. 65, Mar. 1954, p. 89-96.

Based on investigation sponsored by Army Ordnance Corps, Watertown Arsenal, Watertown, Mass., Contract No. DA-11-022-ORD-289. Results of hardening by oxygen, carbon, hydrogen, boron and nitrogen. Graphs, diagram, micrographs, table, photograph. 2 ref. (J28, Ti)

118-J. Nitriding Helps Solve Deep Well Problems. R. L. Chenault and G. E. Mohnkern. *Petroleum Engineer,* v. 26, Mar. 1954, p. 50 + 8 pages.

Hardness, fatigue and corrosion resistance of subsurface equipment improved by new method. Diagrams, graphs, tables, micrographs. 11 ref. (J28, Q29, Q7, R general, AY)

119-J. Portable Base Brightens Annealers' Future. *Steel,* v. 134, Mar. 8, 1954, p. 127-128.

Design permits easy installation and maintenance of single-stack convection furnaces for annealing strip coils. Base mounts on same guide cones as furnace cover. Photographs. (J23)

120-J. Thermal Treatment of Weldments. A. Luthy. *Welding and Metal Fabrication,* v. 22, Mar. 1954, p. 108-111.

Use of heat treatment to reduce internal stresses in constructions subjected to considerable force. Photographs, diagram. (J1)

121-J. Heat Treating the Surface of Welds in Stainless Steel. M. B. Shapiro. *Henry Brutcher, Altadena, Calif., Translation no.* 3187, 7 p. (From *Vestnik Mashinostroeniia,* v. 32, no. 8, 1952, p. 63-65.)

Experimental study on possible elimination of susceptibility of welded stainless steels to intergranular corrosion by treating surface with high-frequency current. Tables, micrographs, diagram. 2 ref. (J2, R2, SS)

122-J. (German.) **Method of Obtaining Intermediate Structures in Medium Sized Chromium-Molybdenum Steel Cylinders.** Walter Eilender and Heinrich Arend. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 85-87.

Tests made in oil, water, and 10% sodium hydroxide quenches. Graphs. 4 ref. (J2, AY)

123-J. (German.) **Hardenability and Testing of Carbon Toolsteels.** Hermann Schottky. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 6, Feb. 21, 1954, p. 165-170.

Procedure for operators with limited equipment and experience. Graphs, diagrams. 29 ref. (J26, TS)

124-J. (German.) **Hardenability and Temperability of Structural Steels and Their Testing.** Hermann Schottky. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 7, Mar. 1, 1954, p. 195-202.

Processes discussed and illustrated. Graphs, table, diagram. 41 ref. (J26, J29, ST)

125-J. (Russian.) **Effect of the Rate of Heating on the Formation of Graphitization Centers During the Annealing of Forged Cast Iron.** I. I. Khoroshev. *Doklady Akademii Nauk SSSR,* v. 94, no. 2, Jan. 11, 1954, p. 221-223.

Longer, continuous heating in temperature range 250 to 420° C. increases number of annealing carbon nodules in modified cast iron. Table. 3 ref. (J23, CI)

126-J. Flame Hardening of Gray Iron Castings. Charles O. Burgess. *Foundry,* v. 82, Apr. 1954, p. 114-121 + 4 pages.

Possibility of improving physical properties, including wear resistance and strentgh, rests on fact that gray iron, like steel, exists in two atomic crystal (allotropic) forms, depending on temperature to which it is heated. Tables, graphs, photographs, diagrams, micrographs. 56 ref. (J2, Q9, Q23, N6, CI)

127-J. Controlled Atmospheres for Heat Treatment of Metals: Methods and Equipment. Ernest S. Lanning, Jr. *Industrial Gas,* v. 32, Mar. 1954, p. 3-6, 19-24.

Atmospheres required for copper, nickel, aluminum, magnesium, precious metals, steel and some of their alloys. Diagrams, graph, table. (J2, Cu, Ni, Al, Mg, ST)

128-J. The Annealing of Copper and Brass Alloys. Arch H. Copeland, Jr. *Industrial Heating,* v. 21, Mar. 1954, p. 444 + 13 pages.

Annealing and use of gas at Revere plant. Photographs, micrographs. (J23, Cu)

129-J. Modern Heat Treat Department Enables Efficient Operation of Sheaffer's New Tool & Die Division. *Industrial Heating,* v. 21, Mar. 1954, p. 460-462, 464.

General view of department illustrates special furnaces, generators and controls used in heat treating tools, dies and various fixtures. Photographs. (J general, TS)

130-J. Let Modern Heat Treatment Turn on the Heat to Turn Down Your Costs. Allen G. Gray. *Steel,* v. 134, Mar. 29, 1954, p. 102-105.

Techniques and equipment which result in economy of materials and production costs. Photographs. (J general, ST)

131-J. Heat Treat Plant Boasts Versatility. *Steel,* v. 134, Mar. 22, 1954, p. 109.

Equipment, plant layout and operating procedures. (J general)

132-J. RF Heating Simplifies Hardening. Ottmar W. Noeske. *Steel,* v. 134, Mar. 15, 1954, p. 120-121.

Hardening of wide variety of sleeves, adaptors, quick-change chucks, boring bars and chuck collets. Photographs. (J2)

133-J. Effect of Heat Treatment Upon the Microstructure and Hardness of a Wrought Cobalt-Base Alloy, Stellite 21 (AMS 5385). F. J. Clauss and J. W. Weeton. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3107, Mar. 1954, 26 p.

Alloy was solution-treated and transformed both by aging and isothermal transformation at temperatures of 1200 to 1950° F. for periods of 5 min. to 72 hr. Graphs, micrographs. 17 ref.
(J27, Q29, M27, Co)

134-J. Oxygen in Malleable Iron. L. W. L. Smith. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Feb. 1954, p. 173-179 + 2 plates.

Influence of oxygen content on annealability of white iron for production of malleable iron, using dilatometric technique. Influence of oxygen in presence of aluminum. Graphs, tables, micrographs. 6 ref. (J23, M23, CI)

135-J. Heat-Treatment of High-Speed Steel. III. Further Considerations on the Heating of High-Speed Steel for Hardening. S. G. Cope. *Metal Treatment and Drop Forging,* v. 21, Mar. 1954, p. 123-130, 137.

Final heat treated steel surface is dependent on type of furnace and atmosphere. Effects of variations in austenitizing conditions, such as temperature and treatment, soaking time and type of heating medium. Photograph, graphs, micrographs. 9 ref. (J22, TS)

136-J. Heat Treating Special Trackwork. *Railway Age,* v. 136, Apr. 5, 1954, p. 70-71.

Enlarged facilities at plant provide process for hardening rail, frogs, crossings and switches. Photographs. (J general, CN)

137-J. Smoke Abatement in Metallurgical Furnaces. R. J. Sarjant. *Smokeless Air,* v. 24, Spring 1954, p. 129-131, 136.

Surveys furnace atmospheres and combustion processes in coal or gas-fired heat treating furnaces.
(J general, A8)

138-J. Heat Treatment for Tank Turrets. H. Borofsky. *Steel Processing,* v. 40, Mar. 1954, p. 181-184.

General procedure and control mechanism. Photographs.
(J general)

139-J. Gears Hardened as They Are Flame-Cut. Glenway Maxon. *Welding Engineer,* v. 39, Apr. 1954, p. 54-55.

Equipment and technique for combining flame-cutting and flame-hardening in single operation. Hardness zone can be precision controlled to meet specifications. Photographs, diagrams. (J2, G22)

140-J. Versatile Steel Carburizing Process Provides Low Cost, Hard Surface Parts. J. B. Froblom and H. W. Hiemke. *Western Metals,* v. 12, Mar. 1954, p. 44-47.

Mechanics of carburization and types of gas furnaces. Graphs, diagram, photographs. (J28)

141-J. (Russian.) **Nitriding Tool Steel.** A. N. Serov. *Stanki i Instrument,* v. 24, no. 9, Sept. 1953, p. 18-20.

Nitriding at 550° C. for 25 to 30 hr. results in formation of layer of sufficient depth to permit increased cutting speed. Graphs, tables. (J28, G17, TS)

142-J. (Russian.) **Use of Cyaniding in Mass Production.** K. V. Kosov. *Vestnik Mashinostroeniia,* v. 34, no. 2, Feb. 1954, p. 62-65.

Temperature of bath, duration, concentration of cyanide, and number of pieces cyanidized simultaneously. Diagrams, graphs, photograph. (J28, ST)

143-J. Estimation and Influence of the Gaseous Elements in Cast Iron. L. W. L. Smith, B. B. Bach and J. V. Dawson. *Foundry Trade Journal,* v. 96, Mar. 18, 1954, p. 303-306; disc., p. 306-309.

Neutralizing effect of aluminum on carbide stabilizing effect of nitrogen during second stage anneal was shown by heat treatment of specimens to which 0.1% aluminum addition was made prior to nitrogen treatment. Micrographs, graphs, table. (J23, CI, Al)

144-J. Simple Test Measures Quenching Power of Salt Baths. R. F. Harvey. *Iron Age,* v. 173, Apr. 8, 1954, p. 154-157.

Eccentric hardenability test specimen is basis of new method for determining effects of agitation on characteristics of hot salt baths. Photograph, graphs, diagrams. 7 ref. (J2, AY)

145-J. Shallow Case-Hardening by a High-Intensity Induction Technique. D. S. Simkins. *Machinery (London),* v. 84, Mar. 26, 1954, p. 650-652.

Includes photographs.
(J28, CI, AY, CN)

146-J. Vacuum Heat-Treatment. W. D. Bennett. *Metal Industry,* v. 84, Mar. 26, 1954, p. 245-246.

Furnace for annealing polished metallographic specimens. Diagram, graph. 2 ref. (J23)

147-J. Hardenability Bands for Boron Steels. *Metal Progress,* v. 65, Apr. 1954, p. 112B.

Data sheet gives graphical results of various compositions. Graphs. (J26, AY)

148-J. Method for Improving Temperature Uniformity in Furnaces. Otto Lutherer and Richard J. Reed. *Metal Progress,* v. 65, Apr. 1954, p. 113-120.

Location of burners relative to load being heated is very important. Addition of large amounts of excess air through burners may improve the temperature uniformity. Graphs, tables, diagram, photographs. (J general)

149-J. Notes on Producing Hardened Parts. A. Ironside. *SAE Journal,* v. 62, Apr. 1954, p. 76-77.

Heat treatment of rear axle shafts, carburized gears and bolts. (J general, ST)

150-J. Vapors Cause Distortion in Quenching. Frank M. Aldridge. *Tooling and Production,* v. 20, Apr. 1954, p. 62-63, 191.

Experiments show distortion and cracking of steel parts during quenching are due to vapor phase rather than speed and temperature of quenching medium. Drawings, graph. (J26, ST)

151-J. (French.) **Flash Annealing. Fine Grain and Malleability.** *Revue de l'Aluminium,* v. 31, no. 207, Feb. 1954, p. 52-54.

Tunnel-type electric furnaces permit rapid heating and cooling of aluminum and light alloys. Photographs. (J23, Al)

152-J. (French.) **Contribution to the Study of Certain Factors Involved in the Induction Hardening of Surfaces.** Gilbert Remy. *Revue de métallurgie,* v. 51, no. 2, Feb. 1954, p. 85-100; disc., p. 100.

Surface hardening results in special conditions of austenization. Conditions depend on power, duration of heating and microstructure of steel. Micrographs, graphs, tables, photographs. (J28, J2, ST)

153-J. (French.) **Design, Manufacture, and Behavior of Flame-Hardened Gears.** H. W. Grönegress. *Revue de métallurgie,* v. 51, no. 3, Mar. 1954, p. 165-172.

Methods, effect on resistance to wear, fracture and fatigue, formula for design and results of various comparative tests. Tables, graphs, diagrams, photographs. (J2, Q general, AY)

154-J. (German.) **Standardization of Aluminum for Conductors.** A. Loeschmann. *Aluminium,* v. 30, no. 3, Mar. 1954, p. 95-98.

High-purity aluminum containing equal amounts of copper and zinc but with varied silicon and iron content were subjected to various heat treatments. Physical and mechanical properties. Tables, graphs. (J general, P general, Q general, T1, Al)

155-J. (Russian.) **Super Short Time High-Temperature Heating in Heat Treatment of Hardened or Mechanically Work-Hardened Metals.** O. L. Bendryshev. *Vestnik Mashinostroeniia,* v. 33, no. 10, Oct. 1953, p. 45-52.

Experiments determine possibility of eliminating mechanical cold hardening. Graphs, micrographs. 9 ref. (J26)

156-J. (Russian.) **Isothermal Hardening of High Speed Cutting Steel.** Iu. A. Geller and S. D. Brik. *Vestnik Mashinostroeniia,* v. 33, no. 10, Oct. 1953, p. 52-56.

Recommends 200 to 300° C. with holding time of 20 to 60 min. Graphs, micrograph. 4 ref. (J26, TS)

157-J. (Russian.) **Hardening of Journals of Crankshafts by Heating With Oxy-Acetylene Flame.** M. B. Shapiro and V. V. Bogdanov. *Vestnik Mashinostroeniia,* v. 33, no. 10, Oct. 1953, p. 56-58.

Good results on compressor shafts for wear prevention. Diagrams, graph. (J2)

158-J. (Swedish.) **Proposed Calculating Values for Heat Resisting Steels Above 350° C.** Cyrill Schaub. *Jernkontorets Annaler,* v. 138, no. 2, 1954, p. 53-80.

Limits of analysis, heat treatment and highest application temperatures for various steels. Graphs, tables. 29 ref. (J general, Q general, SS)

159-J. Designing and Operating a Heat Treating Department. Richard W. Wilson. *American Foundryman,* v. 25, May 1954, p. 102-106. (AFS Convention Preprint no. 54-41.)

Installation designed to handle annealing of low-alloy cast gears, hardening and tempering of carbon and low-alloy steel castings, and stress-relieving of certain gray iron castings. Graph, diagrams, photographs. 2 ref. (J general, CI)

160-J. Some Metallurgical Variables Affecting Quench Cracking Susceptibility of Hollow Alloy Steel Cylinders. C. F. Sawyer and C. C. Busby. *American Society for Metals, Transactions,* v. 46, 1954, p. 100-112.

Effects of austenitizing temperature, normalizing prior to heat treatment, temperature to which quenched, cracking susceptibility of material at different positions in a

forged ingot and chemical composition of steel. Tables, graphs. 3 ref. (J26, AY)

161-J. Surface Hardening of Titanium by Carburizing and Induction Heat Treatment. A. J. Griest, P. E. Moorhead, P. D. Frost and J. H. Jackson. *American Society for Metals, Transactions,* v. 46, 1954, p. 257-275; disc., p. 275-276.

Good wear resistance obtained in laboratory tests on specimens carburized in propane-argon gas mixtures. Thin cases (0.0002 in.) of TiC appeared to have best adherence and wear resistance. Graphs, micrographs, tables, photographs, diagram. 7 ref. (J28, Ti)

162-J. Effect of Carbon and Boron on the Hardenability of a Case-Carburized Steel. R. A. Grange and J. B. Mitchell. *American Society for Metals, Transactions,* v. 46, 1954, p. 446-474; disc., p. 474-482.

Matched pair of 2% manganese steels, one with and one without boron, were carburized and their hardenability measured throughout case and in core by end-quench method. Tables, graphs, micrographs. 14 ref. (J28, ST)

163-J. Heat Transfer to Aluminum. I. Kirtland Marsh. *Industrial Heating,* v. 21, Apr. 1954, p. 658 + 6 pages.

Information for furnace manufacturers in design and construction of furnaces for heating aluminum. Equally valuable to fabricators of aluminum by giving a better understanding of operating characteristics of furnaces when heating various types and classes of products. Photograph, graph, table. 4 ref. (To be continued.) (J general, P11, Al)

164-J. Ultra-Modern Heat Treating Facilities at New Plant of Metallurgical, Inc. *Industrial Heating,* v. 21, Apr. 1954, p. 680 + 6 pages.

Layout of new plant. Operation of furnaces and facilities. Photographs. (J general)

165-J. High Pressure Nitriding for the Heat Treater. R. L. Chenault and G. E. Mohnkern. *Metal Treating,* v. 5, Mar.-Apr. 1954, p. 2-5, 36-37.

Outstanding advantage of nitriding under pressure is that operating temperature and pressure existing during this process causes inactive nitrogen and hydrogen to unite to form ammonia instead of being vented as in conventional methods. Tables, graphs, micrographs, diagrams. 10 ref. (J28)

166-J. Heat Treatment in the Production of Magnets. *Metal Treating,* v. 5, Mar.-Apr. 1954, p. 8-9.

Proper heat treating produces high-cobalt "directionalized" Alnicos, most powerful magnets commercially known today. Photographs. (J general, SG-n)

167-J. Annealing and Patenting With Salt Baths. L. B. Rousseau. *Wire and Wire Products,* v. 29, Apr. 1954, p. 399-400.

Improvements in salt bath furnaces increase utility and variety of applications in wire industry. Photographs. (J2, J23, J25, ST)

168-J. (Russian.) **Optimum Steel Hardening Temperatures Using High Speed Electrical Heating.** V. M. Zalkin. *Stanki i Instrument,* v. 25, no. 1, Jan. 1954, p. 16-17.

Tests made on structural and tool-steels using line-frequency current. Optimum temperature for all steels is 1000° C. or slightly below. Graphs, table. 4 ref. (J2, ST)

169-J. (Russian.) **Decarburization of Steel in Direct Fired Furnaces.** V. F. Kopytov, G. F. Kopytova and P. V. Sorokin. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 36-40.

Tests of ball-bearing steel in atmosphere of city gas at various heating and soaking-time cycles. Recommends faster heat treating processes for steel. Tables, graph, diagrams, micrographs. 1 ref. (J28, ST)

170-J. High Quality Gears Require Precise Heat Treating. John T. Mitchell and Russell Buyea. *Steel Processing,* v. 40, Apr. 1954, p. 249-252.

Production heat treating gears on a large scale involves processing in two distinct phases. Method used at a particular plant desecribed. Photographs. (J general, ST)

171-J. Gear Teeth in Welded Segments Induction Hardened and Tempered. H. J. Boll. *Metal Treating,* v. 5, Mar.-Apr. 1954, p. 6-7, 14.

Procedure used in hardening one tooth at a time. Photographs. (J2)

172-J. Presidential Address. Quenching. George Parkin. *Birmingham Metallurgical Society, Journal,* v. 33, Dec. 1953, p. 143-154.

Mechanism, factors effecting cooling rates, media and variations in practice. (J26, J2, ST)

173-J. Heat-Treatment in Steam. B. R. Swann. *Metal Treatment and Drop Forging,* v. 21, Apr. 1954, p. 168-172.

Tempering, annealing and stress-relieving of metals in steam atmosphere. Method offers certain advantages for treatments between 280 and 625° C. for ferrous metals

and 200 and 625° C. for nonferrous metals. Photographs, table. (J29, J23, J1)

174-J. A Look at Custom Heat Treating. *Steel,* v. 134, May 3, 1954, p. 100-102.

Equipment, plant layout and operating procedures. Diagram, photographs. (J general)

175-J. (German.) **Determining Depth of Hardness of Case-Hardened Steels.** Herbert Müller. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 125-131; disc., p. 131-135.

Critical investigation of fracture structure, macro and microscopic examination of polished specimens, scratch test and hardness-depth curve. Tables, graphs, micrographs. 10 ref. (J28, ST)

176-J. (German.) **The Temperature Dependence of Decarburization of Steel by Hydrogen.** Kurt Lücke. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 181-185.

Experimental and mathematical determination on alpha and gamma iron. Time factor established by tests on carbonyl iron wire. Graphs. (J28, ST)

177-J. (German.) **Economizing in Alloying Elements for Steel by Suitable Heat Treating.** H. Kubisch and H. Tauscher. *Metallurgie und Giesserei Technik,* v. 4, no. 3, Mar. 1954, p. 107-109. (Condensed from *Maschinenbautechnik,* v. 3, no. 1, 1954, p. 5-12; no. 2, 1954, p. 69-74.)

High-temperature bath and isothermal hardening with intermediate stage annealing, surface hardening, bath nitriding, high-temperature phosphating, hot-water treatment of tools and surface diffusion of alloying elements. (J23, J28, L14, N1, ST)

178-J. (Pamphlet.) **Recommended Practice for Post Weld Heat Treatment of Austenitic Weldments.** 1953. American Welding Society, 33 W. 39th St., New York 18, N. Y. $0.50.

Considerations necessary to determine whether, for a given application, stress-relief should be used, and if so, at what time and temperature. (J1, K general)

179-J. (Book.) **Induction and Dielectric Heating.** J. Wesley Cable. 620 p. 1954. Reinhold Publishing Corp., 330 W. 42nd St., New York 36, N. Y. $12.50.

Divided into major sections, dealing with induction and dielectric heating respectively, book contains sufficient theory to enable reader to understand fully basic phenomena applicable to both methods. (J2)

180-J. Just Spin Them in Salt. Charles G. Lee. *American Machinist,* v. 98, May 10, 1954, p. 132-133.

Selective hardening in salt bath needs only a simple motorized fixture, is fast and minimizes gear distortion. Photographs. (J2)

181-J. Short-Cycle Normalizing Coordinates Tube Mill Production. J. Kniveton. *Iron Age,* v. 173, May 6, 1954, p. 136-138.

Equipment, plant layout, operating procedures, advantages. Table, diagram, micrographs, graph, photograph. (J24, ST)

182-J. Investigation of the Heat Treatment of Commercial Titanium-Base Alloys. L. Luini and E. Lee. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 581-592.

Reports wide range of possible hardness and microstructural characteristics. Brittleness and notch sensitivity appear to be characteristic of age hardening to high hardness. Ductility, tensile strength and elongation. Tables, graphs, micrographs. 5 ref. (J general, Q23, Ti)

183-J. Steam Tempering Furnace. *Machinery Lloyd (Overseas Ed.),* v. 26, Apr. 24, 1954, p. 121-122.

Advantages of steam and design considerations for installations. Diagram. (J29)

184-J. Notes on the Relative Merits of Pack and Gas Carburizing. T. S. Lister. *Machinery (London),* v. 84, Apr. 30, 1954, p. 902-904.

Importance of supervision, economics and control. (J28)

185-J. Line of Salt Baths Heat Treats 90-Mm. Gun Recoil Mechanism. Glenn F. Hyde. *Metal Progress,* v. 65, May 1954, p. 104-108.

Compares results to oil quenching. Photographs, diagram, tables. (J2, AY, CI)

186-J. Quench Cracks in Wrought Steel Tubes. Cyril Wells. *Metal Progress,* v. 65, May 1954, p. 113-121.

Nature of cracking statistics, susceptibility, causes and remedies. Graphs, photographs, tables. (J26, Q26, ST)

187-J. (Dutch.) **Inductive Heating With Low Frequencies.** *Bedrijf en Techniek,* v. 9, no. 198; *Electronica Section,* v. 7, no. 145, Mar. 27, 1954, p. 49-51.

Operation of low-frequency heating, effect on work piece and advantages of process. Diagrams, photograph. (J2, Fe, Cu, Al, Zn)

188-J. (French.) **Heat Treatments of Spheroidal Cast Irons.** Marcel Ballay,

Raymond Chavy and Jacques Grilliat. *Fonderie,* Mar. 1954, no. 98, p. 3849-3862; disc., p. 3863.

Six different heat treatments, resulting mechanical properties and structures. (See item 8435, v. 3, June 1954.) Tables, graphs, photograph, diagram. 12 ref.
(J general, Q general, M27, CI)

189-J. (Hungarian.) **Heat Treatment of Magnesium Alloys.** Gyula Emod. *Kohaszati Lapok,* v. 9, no. 2, Feb. 1954, p. 76-85.

Stress relief, homogenization of structure, hardening, control of heat treatment and equipment. Diagrams, graphs, tables, micrographs. 9 ref. (J general, Mg)

190-J. (Hungarian.) **The Applicability of the Electrically Heated Salt Bath Tank Furnace Used for the Heat Treatment of Aluminum, and Methods for Avoiding the Danger of Explosions.** Janos Solymosi. *Kohaszati Lapok,* v. 9, no. 2, Feb. 1954, p. 92-94.

Advantages of uniform temperature in all parts of the furnace. Possibility of treating pieces of varying compositions simultaneously. Diagrams. (J2, Al)

191-J. Heat-Treatments of Welded Structures for Relief of Residual Stresses With Particular Reference to Type 347 Stainless-Steel Weldments. W. L. Fleischmann. *ASME, Transactions,* v. 76, May 1954, p. 645-648.

Treatment at 1100° F. produced untwisting and established a pattern of residual stresses that did not cause any further movement when wire was cycled from room temperature to 850° F. Graphs, tables, diagrams. 11 ref. (J1, SS)

192-J. Heat Treating 50 Tons of Varied Alloys Per Week on Flexible Schedule. K. G. Hookanson. *Industrial Gas,* v. 32, May 1954, p. 6-7, 19-21.

Versatile batch furnaces meet all inventory requirements and "special" runs in 7000 types and sizes of fastenings, with a minimum initial investment. Photographs. (J general)

193-J. Continuous Heat Treat Setup Carburizes Precision Parts. C. A. Payntor. *Iron Age,* v. 173, May 20, 1954, p. 148-150.

Automatic, pusher-type, controlled-atmosphere gas furnaces simultaneously carburize aircraft gears to varying depths. Photographs.
(J28, ST)

194-J. Flame Hardening of Heavy Forgings. Stephen Smith. *Metal Progress,* v. 65, May 1954, p. 100-103.

Specially designed flame hardening machine for large and heavy objects such as steel mill and paper rolls, hydraulic rams and forming press columns. Micrographs, graph, photographs. (J2, ST)

195-J. Annealed Gray Iron Castings. Charles O. Burgess. *Product Engineering,* v. 25, May 1954, p. 142-145.

Annealing improves machinability and mechanical properties. Photograph, tables, graphs. 7 ref.
(J23, G17, Q general, CI)

196-J. Fundamentals of Heat Treatment. I. Carbon Is Key to Hardness, Strength. II. Alloying Agents Add Tailored Properties. Norbert K. Koebel. *Steel,* v. 134, May 17, 1954, p. 102-104; May 24, 1954, p. 98-99.

Effects on physical properties when composition is varied. Photographs, graphs, diagram.
(J general, Q general, ST)

197-J. A Survey of Quenching Oils. James McElgin. *Steel Processing,* v. 40, May 1954, p. 315-318.

Characteristics necessary in straight and compounded mineral oils and new high-speed oils. Photographs, diagrams, graphs. (J2)

198-J. (Russian.) **Heat Treating of Cast Magnesium Alloy ML-5 in Protective Atmospheres.** I. A. Makolkin and S. N. Shestakov. *Zhurnal Prikladnoi Khimii,* v. 27, no. 4, Apr. 1954, p. 421-424.

Effect of carbon dioxide on mechanical properties. Tables. 8 ref.
(J2, Q general, Mg)

199-J. Low Temperature Treatment. I. Antoni Niedzwiedski. *Canadian Metals,* v. 17, May 1954, p. 49-51.

Increase in hardness and freedom from residual internal stress accomplished by holding steel at −120° F, 4 to 6 hr. 16 ref. (J26)

200-J. Hardening by Induction. D. Warburton-Brown. *Mechanical World and Engineering Record,* v. 134, May 1954, p. 212-215, 229-231.

Operation of heating process as applied to steel. Diagrams, graph, tables. 1 ref. (J2, ST)

201-J. A Survey of Applications of British Industrial High Frequency Induction Heating Equipment and Their Economic Aspect. *Metallurgia,* v. 49, no. 295, May 1954, p. 223-229.

Method suited to localized metallurgical heating. Tables graph, photographs, diagram. (J2, A4)

202-J. Deboronization of Steels. J. C. Shyne and E. R. Morgan. *Metal Progress,* v. 65, June 1954, p. 88-90.

Proposes modified standard end-quench test procedure be adopted for boron steels to eliminate possible errors. Graphs, micrograph. 2 ref.
(J28, ST)

203-J. Carbon Restoration of Bar Stock With a Batch-Type Furnace.

H. W. Callahan. *Metal Progress,* v. 65, June 1954, p. 95-99.

Bars from cold finishing mills that require heat treatment are processed in a special radiant tube, car-bottom-type furnace for carbon restoration atmospheres. Diagrams, micrographs, photographs, table. 3 ref. (J28, CN, AY)

204-J. Selection and Heat Treatment of Tool and Die Steels. II. Howard E. Boyer. *Modern Machine Shop,* v. 27, June 1954, p. 124-131.

Data for tool and process engineers and tool and die makers. Table, graphs. (To be continued.) (J general, TS)

205-J. How to Heat Treat Titanium. C. I. Bradford. *Steel,* v. 134, May 31, 1954, p. 92-93.

Details of nitriding, carburizing, carbonitriding, stress-relieving and annealing. Micrographs. (J28, J1, J23, Ti)

206-J. (Book—Russian.) **Heat Treatment of Rails.** I. P. Bardin, editor. 260 p. 1950. Akedemii Nauk, U.S.S.R., Moscow.

Collection of 15 papers on advances in theory and practice and quality of rail steels. Textbook. (J general, T23, ST)

207-J. (Book—Russian.) **Selected Writings on the Heat Treatment of Steel.** Sergei Samoilovich Shteinberg. 256 p. 1950. Government Scientific-Technical Publishing House, Moscow.

Articles of significance in metallurgy of heat treatment. (J general, ST)

208-J. End-Quench Hardenability and Evaluation of Quenching Media. S. C. Das Gupta and D. S. Eppelsheimer. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 96-103.

Water, sodium silicate solutions, Gulf Super-quench, Houghton no. 2 Soluble, and Houghto-Quench oils were used. Effect of different media on steels of similar hardenability but different chemical composition. Graphs, tables. 9 ref. (J26, J2, ST)

209-J. Staining of Clad Aluminium Alloy Sheets During Salt-Bath Heat-Treatment. E. C. Williams and H. J. G. Challis. *Institute of Metals, Journal,* v. 82, June 1954, p. 465-470 + 2 plates.

Causes of staining and methods for its elimination in practice. Tables, micrographs, radiograms. 9 ref. (J2, Al)

210-J. Centralize Atmosphere Generators to Improve Furnace Layout. W. D. Latiano. *Iron Age,* v. 173, May 27, 1954, p. 115-117.

Two different atmospheres can be produced to meet varying demands of both forging and heat treating departments. Photographs, plant layout, table. (J2, F21, SG-h)

211-J. Cold Treatment Increases Strength, Stability of Magnet Steels. W. G. Patton. *Iron Age,* v. 173, June 17, 1954, p. 156-158.

Holding at −120° F. for 8 hr. promotes uniformity and decreases retained austenite. Photographs. (J26, AY)

212-J. Basic Principles of Electrode Type Salt Bath Furnaces. Leon B. Rosseau. *Metal Treating,* v. 5, May-June 1954, p. 2-4, 15.

Operating principle, basic characteristics and construction features. Drawings, table, graphs, photograph. (J2)

213-J. Cost Accounting for Heat Treating. Horace C. Knerr. *Metal Treating,* v. 5, May-June 1954, p. 5, 18.

Survey of problem and suggestion of methods and procedures. (J general, A4)

214-J. Anneal Furnace Makes Double Play. W. M. Hepburn. *Steel,* v. 134, June 14, 1954, p. 128-129.

Brass or steel cartridge cases successfully annealed with only a slight variation in furnace cycle. Photographs, diagram, table. (J23, Cu, ST)

215-J. Pusher Furnaces for Heat Treating. E. W. Weaver. *Steel Processing,* v. 40, June 1954, p. 387-390.

Type of drive and method of work loading. Photographs. (J general)

216-J. Oxy-Acetylene Stress-Relieving of Pressure Vessels. Hans Kunz. *Welding Journal,* v. 33, June 1954, p. 288S-294S. (Abstracted from *Schweissen und Schneiden,* v. 6, 1953, p. 216-225.)

Previously abstracted from original. See item 223-J, 1953. (J1, ST)

217-J. (French.) **Role of Hardenability in Selection of Steel for Mechanical Construction.** A. Rabinovicz. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 4, Apr. 1954, p. 110-119.

Correlation of hardenability and mechanical properties. Design considerations. Micrographs, diagram, graphs, tables. 20 ref. (J26, Q general, ST)

218-J. (Hungarian.) **The Dissolving of the Ferrite Content of Cast Iron by Heat Treatment.** Nandor Hajto. *Ontöde,* v. 5, no. 5, May 1954, p. 102-104.

Elimination of ferrite from cylinder liners. Table, graphs, micrograph. (J general, N8, CI)

219-J. (Hungarian.) **Isothermal Hardening of Cast Iron.** Miklos Cseh. *Ontöde,* v. 5, no. 5, May 1954, p. 105-113.

Effect on mechanical properties. Applications in industry. Tables, graphs, micrographs. 16 ref. (J26, Q general, CI)

220-J. (Russian.) **Theory and Calculation of Induction Heating.** A. V. Donskoi. *Elektrichestvo,* 1954, no. 5, May, p. 52-58.

Solution of problem of ferromagnetic medium bounded by an infinite plane with varying electrophysical properties. Graphs. 3 ref. (J2, P15)

221-J. Improved Salt Bath Technique for Aluminum. *Light Metal Age,* v. 12, June 1954, p. 14, 36.

Free fall quench process cuts process time 40% and distortion 90%. Photographs. (J2, Al)

222-J. Gaseous Cementation—Carbo-Nitriding and Gas Carburizing. L. G. W. Palethorpe. *Machinery (London),* v. 84, June 18, 1954, p. 1281-1285.

Authoritative review of present industrial practice. Photographs, tables, diagram. (J28, CN)

223-J. Fundamentals of Quenching. I-II. Design for Batch Treatment Systems. Alexander J. Jarema. **III. Interrupted Quench Gives Special Properties.** Norbert K. Koebel. *Steel,* v. 134, June 7, 1954, p. 110-112; June 14, 1954, p. 114-116; June 21, 1954, p. 128-130.

Loads, furnace cycles and methods of operation. Application to austempering, martempering and cyclic annealing operations. Graphs, photographs, diagrams. (J26, J23)

224-J. Below Zero Heat Treatment. Rolland S. Jamison. *Steel,* v. 134, June 28, 1954, p. 104-106.

Procedure and results. Hardening and toughening of steel and aluminum. Photographs, graphs, table. (J26, ST, Al)

225-J. Case Hardening Steel by Carburizing. *Steel,* v. 135, July 5, 1954, p. 62-65.

Application for securing desirable mechanical properties. Photographs, tables. (J28, Q general, ST)

226-J. Precipitation Hardening. I-II. How to Work Stainless the Easy Way. A. L. Feild. *Steel,* v. 134, June 28, 1954, p. 100-102; v. 135, July 5, 1954, p. 66-67.

Fabrication of PH grades in the received condition. Subsequent hardening can be done with little danger of scaling and distortion. Strength values are high. Photographs, tables. (J27, SS)

227-J. Heat Treating. *Western Metals,* v. 12, June 1954, p. 80.

Treatment of superhardened struts to control supersonic wings. Photographs. (J general, CN)

228-J. Case Hardening of Steel by Carburizing. Michael B. Bever and Carl F. Floe. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 63-84.

Review of pack, gas and liquid methods. Graphs, tables. 16 ref. (J28, ST)

229-J. Case Hardening of Steel by Carbonitriding and Cyaniding. Michael B. Bever and Carl F. Floe. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 85-100.

Procedures, treatment cycles, atmospheres, furnaces, properties of cases. Micrographs, graphs, table. 22 ref. (J28, ST)

230-J. Case Hardening of Steel by Nitriding. Michael B. Bever and Carl F. Floe. Paper from "'Surface Protection Against Wear and Corrosion". American Society for Metals, p. 101-119.

Processes and equipment, steels for nitriding, structure of cases. Diagrams, graphs, tables, micrographs. 8 ref. (J28, AY, SS, TS)

231-J. Selective Heat Treatment. S. L. Case and H. J. Grover. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 154-162.

High-speed methods for surface hardening of steel parts by induction heating and flame hardening. Economics of processes. Table. 10 ref. (J2, ST)

232-J. (German.) **The Problem of Heat-Treating Steels on the Basis of Their Time-Temperature-Transformation Diagrams.** Franz Wever and Adolf Rose. *Stahl und Eisen,* v. 74, no. 12, June 3, 1954, p. 749-760.

Application of isothermal and continuous cooling curves for determination of processes in specimens of different shapes. Graphs, tables. 19 ref. (J26, N8, AY)

233-J. (Polish.) **Technology of Heat Treatment of Permanent Cast Magnets of Alni, Alnisi, Alnico, and Magnico.** K. Pogorecki. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 1, 1954, p. 36-43.

Precipitation hardening, aging temperature and time and optimum conditions. Photographs, graphs, tables. 5 ref. (J27, SG-n)

234-J. (Polish.) **Investigations of Sintered Permanent Magnets. I. Sintered Permanent Magnets Without Aluminum.** W. Rutkowski. *Prace*

Instytutow Ministerstwa Hutnictwa, v. 6, no. 1, 1954, p. 50-56.

Various methods of heat treatment of sintered magnets of different chemical composition. Magnets with 45% copper, 30% cobalt and 25% nickel with proper quenching and tempering showed best results. Tables, graphs, micrographs. 4 ref. (J general, H general, SG-n)

235-J. **Sub-Zero Treatment of Metals.** H. T. Gregg, Jr. *General Electric Review,* v. 57, July 1954, p. 19-21.

Applications for assembling operations, control of age hardening and stabilization of precision parts. Use as a supplement to heat treatment. Photograph. (J26, J27, K13)

236-J. **Heat Treatment Furnace Developments. Recent Installations for Ferrous and Non-Ferrous Metals.** *Metallurgia,* v. 49, no. 296, June 1954, p. 283-300.

Comprehensive review of furnaces for reheating, stress-relieving, annealing, carburizing, hardening and tempering. Photographs, diagrams. (J general)

237-J. **Induction Heating Generators as Production Tools.** Peter A. Hassell. *Metal Progress,* v. 66, July 1954, p. 94-96.

Design considerations, typical installations and development of new applications. Photographs. (J2)

238-J. **Automatic Carbon Control.** Harold Ipsen and Edward J. Rupert. *Metal Progress,* v. 66, July 1954, p. 98-102.

Instrument and principles for automatic control of carbon potential of atmospheres used in batch-type furnaces. Method uses automatic determinations of dew point to regulate flow of enrichment gas. Results for carburizing and carbo-nitriding treatments for this means of control. Graphs, diagrams, photograph. (J2, J28)

239-J. **Annealing of Titanium.** E. R. Funk. *Metal Progress,* v. 66, July 1954, p. 103-105.

Proper temperature for annealing cold worked titanium sheet appraised by prestraining tensile samples, annealing 1 hr., and pulling to fracture. Best annealing temperature (1100° F.) gave highest total strain. Graphs, table. (J23, Ti)

240-J. **Inert Gas Annealing Puts Zip in Aluminum Strip.** *Steel,* v. 135, July 12, 1954, p. 112-113.

Orange peel and earing minimized by annealing in a nitrogen atmosphere. Photographs. (J23, Al)

241-J. (Russian.) **Investigation of Low-Temperature Treatment on Mechanical Properties of Heat Treated High Speed Steel.** V. I. Makarova. *Vestnik Machinostroeniia,* v. 33, no. 12, Dec. 1953, p. 63-66.

Steels of different composition were hardened at 1260 to 1280 and 1300 to 1320° C., annealed in range of 50 to 650° C. and low temperature treated at −78° C. Graphs. (J26, Q general, TS)

242-J. (Russian.) **Annealing Resistance of a Layer Hardened by the Electric Spark Method.** V. N. Tsvibel', B. A. Krupitskii and L. N. Balakina. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 75-76.

Effects of annealing temperature on hardness in layers hardened with different electrodes. Graphs, micrograph. 5 ref. (J23, Q29, CN)

243-J. **A Comparison of Economics and Methods for Heating Steel Strip.** C. E. Peck. *Blast Furnace and Steel Plant,* v. 42, July 1954, p. 791-799.

Comparative study of various methods of annealing and tempering. Tables, graph. (J23, J29, ST)

244-J. **Through-Carburizing Simplifies Production of Formed Parts.** W. D. Latiano. *Iron Age,* v. 174, July 22, 1954, p. 115-117.

Low-carbon steel parts combine ease of forming with high physical properties. Photographs, diagram. (J28, CN)

245-J. **Carbonitriding.** ASM Committee on Heat Treating. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 124-126.

Process; equipment; atmospheres; composition, hardness and tempering of case; advantages of carbonitriding; disadvantages; and cost factors. Micrographs, tables, graphs. (J28)

246-J. **The Agitation of Quenching Mediums.** ASM Committee on Heat Treating. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 126-127.

Effect of flow rate of oil. Correlation curves for water, oil, and molten salt. Graphs. (J2)

247-J. **The Cost of Heat Treating.** ASM Committee on Heat Treating. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 128 + 4 pages.

Recommended procedures for determining costs. Cost of hardening a carburizing pinion gear. Comparative costs for carburizing by the batch gas method versus the continuous pack method. Comparative costs of gas and pack carburizing in two plants. Tables. (J general, J28, A4)

248-J. **Case Hardening Steel by Carbonitriding.** *Steel,* v. 135, July 26, 1954, p. 98-100, 102.

Advantages; methods. Photographs, table, diagram. (J28, ST)

249-J. **Solution Heat Treating, Annealing and Strain Relieving in One Salt Bath Furnace.** T. H. Atkinson and W. Paul Thompson. *Wire and Wire Products*, v. 29, July 1954, p. 744-745.

Versatility of the salt bath furnace in the production of cold headed products. (J2)

250-J. **Modern Methods of Wire Annealing.** *Wire Industry*, v. 21, July 1954, p. 704, 707.

Birlec furnace operation for annealing various types of wire. Photographs. (J23)

251-J. (Dutch) **The Furnace Laboratory.** I. C. H. Luiten. *Smit Medelelingen*, v. 9, no. 2, Apr.-June 1954, p. 54-58.

Laboratory work on development of heat treating processes and equipment. Photographs, diagrams. (J general)

252-J. (German.) **Three Years Experience in the Heat Treatment of Basic Steel for Arched Mine-Roof Supports.** Karl Fröhlich. *Glückauf*, v. 90, nos. 25-26, June 19, 1954, p. 637-651.

Strength properties and toughness requirements. Importance of proper melting, heat treating, testing, and processing. Photographs, tables, diagrams. 15 ref. (J general, Q23, T28, CN)

253-J. (Russian.) **Rapid Case Hardening With Induction Heating.** A. D. Assonov, K. Z. Shepeliakovskii, and P. A. Lankin. *Vestnik Mashinostroeniia*, v. 34, no. 6, June 1954, p. 56-60.

Equipment and techniques for automatic carburizing and nitriding. Tables, graph, photographs, diagrams. (J2, ST)

254-J. **Heat-Treatment of High-Speed Steel. VI. Methods of Hardening. VII. Surface Treatments.** S. G. Cope. *Metal Treatment and Drop Forging*, v. 21, June 1954, p. 295-302; July 1954, p. 343-347.

Hardening procedures including normal methods, bainite hardening and subzero cooling techniques. Nitriding, oxide coating and chromium plating. Graph, diagram, table. 32 ref. (To be concluded.) (J26, J28, L14, L17, TS)

255-J. **Modern Isothermal Heat Treating Methods Reduce Warpage, Cracking.** Bernard P. Planner. *Western Metals*, v. 12, July 1954, p. 43-47.

Isothermal and salt bath quench heat treating methods. Equipment and procedures. Causes and remedies for defects. Photographs, graphs, tables. (J23, J2)

256-J. (German.) **Line Frequency Induction Heating of Light Metal Bars.** H. Rohn. *Aluminium*, v. 30, no. 7, July 1954, p. 298-300.

Experimental determination of capacity and current consumption and advantages of the process. Photographs, table. 6 ref. (J2, Al)

257-J. (Swedish.) **Effect of Temperature on the Decarburization Rate of Iron and Steel.** John Olof Edström and Stig-Erik Erikson. *Jernkontorets Annaler*, v. 138, no. 7, 1954, p. 414-422.

Theoretical calculation confirmed by tests on iron powders. Graphs, photomicrograph. 8 ref. (J28, CI, ST)

258-J. **Modern Heat Treating. VII. Case Hardening Steel by Nitriding.** *Steel*, v. 135, Aug. 9, 1954, p. 96-98.

Steel compositions, properties and structure. Nitriding procedures and furnaces. Photographs, tables. (J28, CN, AY)

259-J. (German.) **Cracking of Low Alloy Steels Caused by Abrupt Temperature Changes.** Wilhelm Rädeker. *Stahl und Eisen*, v. 74, no. 15, July 15, 1954, p. 929-941; disc., p. 941-943.

Effects of repeated quenching and reheating. Mechanism of crack formation. Micrographs, photographs, diagrams, tables, graphs. (J26, AY)

260-J. (German.) **Hardenability of Copper-Manganese-Nickel Alloys. I. Hardness and Structure Investigations.** Otto Dahl and Karl-Ludwig Dreyer. *Zeitschrift für Metallkunde*, v. 45, no. 6, June 1954, p. 342-349.

Effects of component ratios, heat treating conditions and rolling cycles on mechanical and electrical properties. Graphs, micrographs. 6 ref. (J26, Q general, P15, Cu, Mn, Ni)

261-J. (Russian.) **Gas Carburization With Induction Heating.** A. M. Tarasov and B. A. Stetsenko. *Vestnik Mashinostroeniia*, v. 34, no. 7, July 1954, p. 50-52.

Apparatus, operating conditions. Microstructure of gear teeth. Diagram, micrographs, photographs. (J28, J2, M27, ST)

262-J. (Russian.) **Electric Spark Hardening of Machine Parts.** A. V. Poliachenko. *Vestnik Mashinostroeniia*, v. 34, no. 7, July 1954, p. 65-70.

Treatment of cutting surfaces. Hardness and resistance to wear. Electrode compositions. Table, graphs, micrographs. 5 ref. (J2, Q29, Q9, ST)

263-J. (Book.) **Aluminum Heat Treating.** 118 p. Reynolds Metals Co., Louisville, Ky. $1.00.

Nontechnical discussion of aluminum alloy metallurgy and heat treatment of cast aluminum products. (J general, Al)

264-J. Some Practical Aspects of Induction Hardening. D. Warburton-Brown. *Machinery (London)*, v. 85, July 23, 1954, p. 159-170.

Applications considered on basis of heat behavior, metallurgy and mechanical handling. Photographs, graphs, diagrams, tables. (J2)

265-J. Liquid Carburizing. Thomas M. Dougherty. *Metal Progress*, v. 66, Aug. 1954, p. 89-90.

Production of bearings increased 350% with half the manpower by changing from 21 batch-type pack carburizing furnaces to two salt furnaces for liouid carburizing. Photographs. (J28, J2, CN)

266-J. Improved Hardening Technique. Eduard M. H. Lips and H. Van Zuilen. *Metal Progress*, v. 66, Aug. 1954, p. 103-104.

Method involves formation of martensite on bainite from a deformed austenitic structure. Work is done at a heat below recrystallization temperature. Examples of results. (J26, CN, AY)

267-J. (French.) **Annealing of Thin Sheets.** J. Van Volsem. *Revue universelle des mines*, v. 10, ser, 9 no. 7, July 1954, 2 p.

Equipment and processes for hot and cold rolled steel. Photographs. (J23, ST)

268-J. (French.) **Analysis of Treatments in a Gaseous Atmosphere.** R. Boutigny. *Revue universelle des mines*, v. 10, ser. 9, no. 7, July 1954, p. 430-438.

Techniques of introducing conditioning gas into furnaces, characteristic compositions and practical applications. Graphs, tables. (J28, J2, Ni, Co, Zn, Cu, ST)

269-J. (French.) **Heat Treatments in Atmospheres With High Nitrogen Content.** J. Guingand. *Revue universelle des mines*, v. 10, ser. 9, no. 7, July 1954, p. 438-445.

Properties, production equipment and applications of atmospheres with $>90\%$ nitrogen. Graphs, tables, diagrams. (J2, ST)

270-J. (French.) **Controlled Cracked Ammonia-Base Atmospheres in Heat Treatment Furnaces. Mechanical and Electrical Construction of Furnaces.** Paul R. Duré. *Revue universelle des mines*, v. 10, ser. 9, no. 7, July 1954, p. 445-457.

Techniques and characteristics of atmospheres for treatment of various metals and alloys. Diagrams, tables, graphs. (J2, CI, ST, Ni, Cu, Mo, W, WC, Au, Ag)

271-J. (French.) **Generating Furnaces and Apparatuses for Gaseous Recarbonization, Cementation, and Carbo-Nitriding.** C. Demoulin. *Revue universelle des mines*, v. 10, ser. 9, no. 7, July 1954, p. 457-463.

Construction, types and operation of furnaces and gas generators. Diagrams, photograph. (J28, ST)

272-J. (French.) **Malleable Cast Iron. Recent Developments in Annealing Practice.** P. F. Hancock. *Revue universelle des mines*, v. 10, ser. 9, no. 7, July 1954, p. 463-472.

Gaseous annealing of white and blackheart malleable cast irons. Use of elevator-type furnaces. Photographs, diagrams, micrograph, graph. 9 ref. (J23, CI)

273-J. (French.) **Putting Isothermic Treatments Into Practice.** M. Stempfel. *Revue universelle des mines*, v. 10, ser. 9, no. 7, July 1954, p. 490-492.

Distinguishes between isothermic annealing, bainitic hardening of carbon steels and hardening of high speed steel. (J23, J26, CN, ST)

274-J. (French.) **Isothermic Tempering in Practice.** R. Mossoux and E. Progneaux. *Revue universelle des mines*, v. 10 ser. 9, no. 7, July 1954, p. 492-503.

Heat treatment of steam-turbine blades and parts of automatic light arms. Graphs, diagram, table. (J29, AY)

275-J. (French.) **Surface Treatments by High Frequency.** A. R. Baffrey. *Revue universelle des mines*, v. 10, ser. 9, no. 7, July 1954, p. 509-514.

Qualitative and quantitative analysis of laws controlling the surface heating of steel. Graphs, diagrams, photographs. 2 ref. (J2, ST)

276-J. (French.) **Equipment for Gaseous Carburizing.** J. A. Swain. *Revue universelle des mines*, v. 10, ser. 9, no. 7, July 1954, p. 514-530.

Processes of gaseous carburizing and cyaniding combined with tempering. Tables, photographs. (J28, ST)

277-J. (French.) **Modern Pit Furnaces for the Heat Treatment of Steels.** Hans Bühler. *Revue universelle des mines*, v. 10, ser. 9, no. 7, July 1954, p. 542-548.

Gas-heated furnaces for handling large parts. Diagrams, photographs. 7 ref. (J general, ST)

278-J. (German.) **Development and Status of Malleablizing and Tempering in Gas Atmospheres.** Hienrich Poetter. *Metallurgie und Giessereitechnik*, v. 4, no. 6, June 1954, p. 265-272.

Principal reactions in production of white and blackheart malleable iron in different atmospheres. Furnaces and furnace controls. Graphs, tables, diagrams, photograph. 25 ref. (J23, J29, CI)

279-J. Process Applications for Dual-Frequency Induction Heating. R. S. Segsworth. *Canadian Metals,* v. 17, Aug. 1954, p. 38, 40, 42, 44.

Factors affecting depth of penetration, costs. Uses for heat treating and melting. Diagram. 3 ref. (J2, C21, D6)

280-J. Tractor Shovels Need Tough Gears and Parts. R. H. Marshall. *Industrial Gas,* v. 33, Aug. 1954, p. 11-14, 20.

Use of high production, gas-fired batch furnaces to marquench and dry cyanide automotive parts. Photographs, diagram, tables. (J26, J28, ST)

281-J. Annealing Steel and Brass Shell Cases. W. M. Hepburn. *Industrial Heating,* v. 21, Aug. 1954, p. 1496 + 8 pages.

Furnaces, conveyors and other equipment. Photographs, tables, diagrams. (J23, CN, Cu)

282-J. Heat Transfer to Aluminum. IV. Kirtland Marsh. *Industrial Heating,* v. 21, Aug. 1954, p. 1510-1512, 1514.

Use of an exponential equation for calculating the size of a furnace for a given output of aluminum. Graph, table. (J general, Al)

283-J. On Heat Treated Parts. Dimensional Control System Cuts Finishing Costs. L. L. McArthur and E. H. Kinne. *Iron Age,* v. 174, Aug. 19, 1954, p. 121-124.

Master charts pinpoint exact amount of finishing stock needed to compensate for dimensional changes and distortion during heat treatment. Photographs, tables. (J general)

284-J. The Cassel Sulfinuz Process. *Machinery (London),* v. 85, Aug. 6, 1954, p. 291-293.

Sulfurizing process for carbon, alloy and toolsteels and cast iron. Increases resistance to wear and seizure and reduces coefficient of friction between treated surfaces. Tables. (J28, Q9, ST)

285-J. Mechanization and Application of Salt Bath Furnaces. Leon B. Rosseau. *Metal Treating,* v. 5, July-Aug. 1954, p. 2 + 5 pages.

Handling mechanisms. Applications of furnaces for hardening, carburizing, quenching, annealing, brazing and reheating. Photographs, diagrams. (J2, ST, EG-a)

286-J. Cost Accounting for Heat Treating. *Metal Treating,* v. 5, July-Aug. 1954, p. 4 + 8 pages.

Includes "Introduction", K. U. Jenks; "Determination of Expenses", Frederick C. Rimmele; and "Allocation of Expenses", Conrad H. Knerr. (To be continued.) (J general, A4)

287-J. A Work Horse for Industry —the Walking Beam Furnace. W. A. Darrah. *Metal Treating,* v. 5, July-Aug. 1954, p. 10-11.

Construction, heating by gas, oil or electricity and hearth loading. Photograph, diagrams. (J general)

288-J. Steel Supplier Has Modern Plant for Customer Service. Arthur Q. Smith. *Metal Treating,* v. 5, July-Aug. 1954, p. 12-13.

Warehouse heat treating facilities, including furnaces and inert gas generator. (J general, ST)

289-J. Controlled Agitation Advantageous in Hot Salt Quenching. R. F. Harvey. *Steel Processing,* v. 40, Aug. 1954, p. 519-524.

Equipment and techniques for optimum benefits of process. Diagrams, photographs, graphs. (J2, AY)

290-J. King Size Furnace Handles Water Shipped Assemblies. Harold F. Knab. *Western Metals,* v. 12, Aug. 1954, p. 52-53.

Features of giant heat treat furnace. Photographs. (J general)

291-J. Definitions of Heat Treating Processes. P. Riebensahm. *Henry Brutcher, Altadena, Calif., Translation no.* 3030, 15 p. (Condensed from *Haerterei-Technische Mitteilungen,* v. 4, 1949, p. 57-66.)

Basis for developing new heat treating practices and their application. Graphs. (J general, ST)

292-J. (French.) **Contribution to the Study of Secondary Hardening of Low-Alloy Ferrite Steels and Its Application to Creep.** Albert Portevin, André Constant and Georges Delbart. *Comptes rendus,* v. 239, no. 2, July 12, 1954, p. 138-141.

Heat treatment of vanadium ferritic steels with precipitation of fine vanadium carbides during creep resulting in better hot strength. Graphs, table. 5 ref. (J26, Q3, AY)

293-J. (German.) **Apparatus for the Generation of Protective Gases From Ammonia.** Ferdinand Brieger. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 448-452.

Simple apparatus generates protective gases by dissociating NH_3. Advantages and possible uses. Diagrams, tables, photographs, graph. (J2)

294-J. Induction Hardening Improves Gear Life, Shortens Heat Treating Cycle. W. L. Walz. *Iron Age,* v. 174, Aug. 26, 1954, p. 93-96.

Improved techniques result in better quality and lower processing costs. Diagrams, photograph. (J2, ST)

295-J. Heat-Treatment of High-Speed Steel. VIII. Annealing Treatment. S. G. Cope. *Metal Treatment and Drop Forging,* v. 21, Aug. 1954, p. 365-368.

Applications to cold and hot working operations. Details of other treatments. Graphs. 12 ref. (J23, J general, TS)

296-J. Salt Bath Heat Treating, Old Process With New Ideas. *Steel,* v. 135, Aug. 30, 1954, p. 68-71.

Versatility for heating and cooling metals provides wide range of uses. Isothermal method gives new properties to metals and holds down distortion. Photographs, graph. (J2)

297-J. Stress-Relieving of Large Fractionating Column. *Engineer,* v. 198, Sept. 3, 1954, p. 327.

Details of temporary furnace and heating schedules for treating central weldment. Photograph, diagram, graph. (J1, K general, ST)

298-J. Supplying a Fine Metallurgical Service. Roger W. Edmonson. *Industrial Gas,* v. 33, Sept. 1954, p. 3 + 5 p.

Heat treating plant. Photographs. (J general)

299-J. Induction Surface Hardening of Ductile Iron. Joseph F. Libsch and Joseph C. Danko. *Metal Progress,* v. 66, Sept. 1954, p. 115-121.

Techniques for production of hardened surface layers. Typical structures and mechanical properties. Graphs, micrographs, tables. (J2, Q general, CI)

300-J. Rotaflame Burners Heat Rectangular Furnace. W. Trinks. *Steel,* v. 135, Sept. 13, 1954, p. 132, 135.

Whirling flames keep temperature constant, soft spots on surface of steel mill rolls eliminated during annealing cycle. Photograph. (J23, ST)

301-J. Heat Treatment of Aircraft Gears in Continuous Furnaces. C. A. Payntor. *Steel Processing,* v. 40, Sept. 1954, p. 585-590.

Techniques and equipment for carburizing and hardening high precision gears made of AMS 6260 steel. Micrographs, tables, photographs. (J28, AY)

302-J. (German.) **Change of Dimensions of Carburizing Steels on Case Hardening.** Bruno Finnern. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 7-8, July-Aug. 1954, p. 345-350.

Correlation between dimensional change and chemical composition, core strength, surface hardness and depth of hardness. Carburization followed by simple hardening affects least change in dimensions. Tables, diagrams, micrographs. 10 ref. (J28, CN, AY)

303-J. (German.) **Nitriding Tubes of Austenitic Chromium-Nickel-Molybdenum Steel With Nitrogen by the Internal-Pressure Experiment at 700° C.** Franz Braumann and Hans Krächter. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 7-8, July-Aug. 1954, p. 373-375.

Chemical, metallographic and X-ray study of steel nitrided 10,000 hr. shows that the nitrogen content of the nitrided layer was raised from 0.017% to 2.2%. Micrographs, table, X-ray recordings. 3 ref. (J28, ST)

304-J. Calculation of Hardenability in High Carbon Alloy Steels. C. F. Jatczak and R. W. Devine, Jr. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 14, 1954, 21 p.

Effects of manganese, silicon, chromium, nickel and molybdenum studied by end-quench test for various conditions. Empirical calculation of hardenability by multiplication factors. Tables, graphs. 6 ref. (J26, AY)

305-J. Hardenability of Carbon Tool Steel. Neil J. Culp. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 15, 1954, 19 p.

Construction and application of curves predicting depth of hardening. Results compared with experimental data. Tables, graphs. 14 ref. (J26, TS)

306-J. Effect of Carbon and Nitrogen on the Attainable Hardness of Martensitic Steels. A. E. Nehrenberg, Peter Payson and Peter Lillys. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 16, 1954, 12 p.

Empirical equation shows relationships. Chromium had no effect on attainable hardness. Tables, graphs. 4 ref. (J26, CN, AY)

307-J. The Role of Water Vapor and Ammonia in Case Hardening Atmospheres. P. A. Clarkin and M. B. Bever. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 31, 1954, 15 p.

Tests on AISI 1020 at 1475, 1550

and 1625° F. in various atmospheres. Table, graphs. 22 ref. (J2, J28, CN)

308-J. Get Up to Date on Induction Heating Control. John V. Metzger. *Control Engineering,* v. 1, Oct. 1954, p. 50-54.

Production costs reduced by consistently higher product quality through more uniform regulation of heat and by safe guarding equipment and work. Photographs, diagrams, circuit diagrams. (J2)

309-J. Continuous Annealing of Stainless Steel Sheets in Roller Hearth Furnace. *Industrial Heating,* v. 21, Sept. 1954, p. 1718-1720 + 5 pages.

Furnace construction, roller hearth mechanism, refractory radiant tubes, burner equipment, control equipment, discharge table and furnace performance. Photographs, diagram. (J23, SS)

310-J. Decarb, Distortion Exit With Salt Bath Furnace Treatment of Landing Gears. Frank Fenger. *Western Metals,* v. 12, Sept. 1954, p. 47-49.

Treatment of medium alloy steel parts up to 62½ in. long. Photographs, table, micrographs. (J2, AY)

311-J. Retention of Hardness in Medium-Carbon Steel Hard Faced by Electrospark Process. V. N. Tsvibel, B. A. Krupitskii and L. N. Balakina. *Henry Brutcher, Altadena, Calif., Translation no.* 3306, 6 p. (From *Vestnik Mashinostroeniya,* v. 33, no. 12, 1953, p. 75-76.)

Previously abstracted from original. See item 242-J, 1954. (J23, Q29, CN)

312-J. Heat Treating of Ingot Molds. H. Gau and W. Küntscher. *Henry Brutcher, Altadena, Calif., Translation no.* 3368, 4 p. (Condensed from *Metallurgie und Giessereitechnik,* v. 2, no. 4, 1952, p. 98-100.)

Study of best heat treatment for optimum structure as well as minimum residual stresses in gray-iron molds for steel ingots. Table, micrographs, graphs. (J general, CI)

313-J. Cold Treatment Improves Accuracy, Life of V-Blocks. Bruno Sainati. *Iron Age,* v. 174, Oct. 14, 1954, p. 136-137.

Treatment of gages made from carburized low-alloy steel. Photographs, micrographs. (J2, AY)

314-J. Influence of Boron on Hardenability of Steel. J. C. Fisher. *Journal of Metals,* v. 6, Oct. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Oct. 1954, p. 1146-1147.

Model for describing action of boron. 6 ref. (J26, AY)

315-J. End-Quench Experiments With Aluminium Bronze. A. R. Bailey and H. C. Skevington. *Metal Industry,* v. 85, Oct. 1, 1954, p. 285-288.

Effects of rapid cooling on structures and mechanical properties. Tables, graphs, micrographs. 5 ref. (J26, Q general, Cu, Al)

316-J. Annealing for Optimum Machinability. H. C. Thomas. *Metal Treatment and Drop Forging,* v. 21, Sept. 1954, p. 403-406.

Heat treatment of low-alloy carburizing steels of SAE 4620 type and the results of machining tests. Micrographs, graphs. (J23, G17, AY)

317-J. Heat-Treatment in the Aircraft Industry. *Metal Treatment and Drop Forging,* v. 21, Sept. 1954, p. 411-412.

Furnaces required for aluminum alloy, beryllium copper and steel castings. Photographs. (J general, Al, Cu, CI)

318-J. (German.) **Oxy-Acetylene Stress Relief in Large Welded Constructions in Ship and Container Building.** H. Kunz. *Schweissen und Schneiden,* v. 6, no. 8, Aug. 1954, p. 328-340.

Techniques and equipment. Table, graphs, diagrams, photographs. 15 ref. (J1, ST)

319-J. (German.) **"Quetten"—Hardening Machines for Sheet Metals and Rolled Shapes.** H. Bühler. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 25, Sept. 1, 1954, p. 839-841.

To prevent warping from hardening, the steel sheets or parts are squeezed between two grates during the quenching process. Several types described and illustrated. Photographs, diagrams. (J26, ST)

320-J. (Russian.) **Heat Treatment of Welded Seams of Stainless Steel.** V. V. Chernyshev. *Vestnik Mashinostroeniia,* v. 34, no. 8, Aug. 1954, p. 83-85.

Effects of various heat treatments on corrosion resistance of welded chromium-nickel steels. Photographs, micrographs, table. (J general, R general, SS)

321-J. Texas-Produced Steel Pipe Normalized by High-Speed In-Line Gas Equipment. James Kniveton. *Gas Journal,* v. 181, Oct. 1, 1954, p. 16-17, 42.

Normalizing line and operating procedures. Photographs, diagrams, micrographs, table. (J24, CN)

322-J. Strategic Use of Outside Heat Treating Facilities Can Cut Costs. Ernest M. Olson. *Metal Treating,* v. 5, Sept.-Oct. 1954, p. 2-3, 30.

Factors determining when to farm out work or to purchase special equipment. Photographs. (J general)

323-J. Heat Treating Aluminum 'Superalloys'. Thomas A. Dickinson. *Metal Treating,* v. 5, Sept.-Oct. 1954, p. 10-11, 40.

Precautions and techniques in cleaning and heat treating of 75S aluminum alloys. Photographs, tables. (J general, L general, Al)

324-J. Induction Heat Treating. Selectivity Teams Up With Versatility. *Steel,* v. 135, Oct. 18, 1954, p. 92-95.

Advantages for hardening, tempering or stress-relieving parts in production lines. Photographs. (J2)

325-J. Continuous Patenting, Cleaning, and Coating. Donald K. White. *Wire and Wire Products,* v. 29, Oct. 1954, p. 1131-1140, 1248-1250.

Equipment and treatments for large-scale production of steel wire. Flow sheets, photographs, diagrams, table. (J25, F28, L general, CN)

326-J. Flame Hardening Now Applied to Bearing Areas of Crankshafts. Herbert Chase. *Automotive Industries,* v. 3, Oct. 15, 1954, p. 48-51.

Techniques and advantages of flame heating and quenching process to increase hardness. Photographs. (J2, ST)

327-J. 60-Cycle Induction Heating of Steel. C. D. Kramer. *Electrical Engineering,* v. 73, Nov. 1954, p. 1009-1012.

For certain specimen shapes low-frequency heating is economical. Graphs, photograph. 4 ref. (J2)

328-J. Improved Quench Methods Developed for Austempering, Martempering. Q. D. Mehrkam. *Iron Age,* v. 174, Oct. 28, 1954, p. 99-102.

Equipment, techniques and controls to improve properties of treated parts. Graphs, diagrams, photograph. (J26, ST)

329-J. Age-Hardenable Methods. John L. Everhart. *Materials & Methods,* v. 40, Oct. 1954, p. 121-136.

Age hardening processes and mechanical and physical properties of light metals, heavy nonferrous alloys, irons, steels and superalloys. Photographs, table. (J27, P general, Q general, EG-a, Fe, ST, SG-h)

330-J. Induction Hardening Practice and Equipment. *Mechanical World and Engineering Record,* v. 134, Oct. 1954, p. 452-455.

Principles and practice of the technique and considerations for wider applications. Photographs. (J2)

331-J. Induction Heating for Large Weldments. H. B. Osborn, Jr., and A. Lüthy. *Tool Engineer,* v. 33, Nov. 1954, p. 82-84.

Method provides proper control of heating before and after welding operations. Photographs. (J2, K general, ST)

332-J. Gas Carburizing. Its Application to Design. F. H. Conaty. *Western Machinery and Steel World,* v. 45, Oct. 1954, p. 110-114.

Basic principles, typical microstructures, processing techniques, design considerations. Micrographs, drawing, graphs, photographs. 6 ref. (J28, M27, ST)

333-J. (German.) **Quenching and Reheating of Steel Strip After Heating in the Continuous Furnace and After Direct Electric Resistance Heating.** Hermann Stromberg and Anton Pomp. *Stahl und Eisen,* v. 74, no. 21, Oct. 7, 1954, p. 1343-1358.

Equipment and techniques for tempering carbon steel strip. Mechanical properties produced by various treatments. Diagrams, graphs, tables, micrographs. 20 ref. (J29, Q general, CN)

SECTION K

JOINING

1-K. Bimetallic Water Heaters Brazed for Strong, Tight Joints. Albert H. Trageser. *Iron Age,* v. 172, Nov. 5, 1953, p. 176-177.

Copper for corrosion resistance and steel for strength have been combined to produce hot-water heaters at moderate cost, yet with excellent serviceability. Diagram, photographs. (K8, T27, Cu, CN)

2-K. Better Tank Construction Methods Increase Lining Life. Manson Glover. *Iron Age,* v. 172, Nov. 5 1953, p. 178-182.

Techniques to be observed to insure close, permanent bond between rubber or plastic lining and shell. Photographs, diagrams, table. (K11)

3-K. Sheet Metal Welded Joints. Fred Rogers. *Modern Machine Shop,* v. 26, Nov. 1953, p. 182-184, 186, 188.

How machine designer can make it difficult or simple for welder as to type of welded joint specified. Diagrams. (K general, CN)

4-K. Properties of Preloaded Steel Bolts. W. C. Stewart. *Product Engineering,* v. 24, Nov. 1953, p. 191-195.

Effects of applied torque, relaxation, preloading and repeated impact loads. Diagrams, tables, graphs. 12 ref. (K13, Q6, CN)

5-K. Black-Up Flux: New Aid to Welding. Alvin L. Bennett. *Welding Engineer,* v. 38, Nov. 1953, p. 38-40.

Problems, functions, techniques and applications of fluxing. Photographs, diagrams. (K1, AY, SS)

6-K. How to Weld 430 Stainless. Lester F. Spencer. *Welding Engineer,* v. 38, Nov. 1953, p. 42-46, 48.

Reports that ferritic stainless steels are acceptable substitutes in many instances for nickel-bearing austenitic stainless steels. Corrosion and heat resistance, preheating and annealing and welding techniques. Photographs, tables. 8 ref. (K general, SS)

7-K. Adhesive Joints. *Aircraft Production,* v. 15, Nov. 1953, p. 402-406.

Tests and structural applications of Redux-bonding process. Diagrams, photographs, graphs. (K12)

8-K. Sheet-Metal Welding. II. Resistance-Welding in the Fabrication of Gas-Turbine Assemblies. *Aircraft Production,* v. 15, Nov. 1953, p. 420-429.

Resistance welding equipment and techniques adapted in use of mechanical fixtures. Table, diagrams, photographs. (K3)

9-K. Universal Welder Reduces Welding Costs. *American Machinist,* v. 97, Nov. 9, 1953, p. 126-128.

Unit in which fixtures are eliminated by radial-arm head mounting arrangement, making submerged-melt welding practicable on low-activity assemblies. Photographs, diagrams. (K1)

10-K. Welded Tubular Steel Factory Structure. *Engineer,* v. 196, Oct. 30, 1953, p. 570-572.

Structural frame of factory which consists of a completely welded assembly of tubular steel columns and trusses. Photographs, diagrams. (K general, CN)

11-K. Automatic Welding Cuts Costs of Fan and Blower Elements. *Machine and Tool Blue Book,* v. 49, Nov. 1953, p. 185-186, 188, 190, 192.

Equipment, application and advantages. Photographs. (K1)

12-K. Mechanical Fastening of Magnesium Assemblies. *Magnesium,* 1953, Nov., p. 1-6.

Procedures for assembly of parts by riveting, bolts and nuts, inserts, pins, dowels, keys and other fasteners. Photographs. (L13, Mg)

13-K. How to Control Carbide Precipitation in Welding Stainless Steels. G. E. Linnert and R. M. Larrimore, Jr. *Materials & Methods,* v. 38, Nov. 1953, p. 98-103.
Post annealing, use of special grades of steel, and proper welding technique are recommended as most satisfactory methods.
(K general, J23, SS)

14-K. The British Welding Research Association. K. Winterton. *Metallurgia,* v. 48, no. 288, Oct. 1953, p. 187-191.
Report of progress in welding field and suggested projects for future work. Photographs. (K general, A9)

15-K. An Unusual Application of Aluminium Flame Brazing. F. J. M. Smith. *Sheet Metal Industries,* v. 30, no. 319, Nov. 1953, p. 935-942.
Brazing of small-gage sheet. Diagrams, photographs. (K8, Al)

16-K. Welding Ultra-Thin Materials. *Sheet Metal Industries,* v. 30, no. 319, Nov. 1953, p. 967-968.
Gas-shielded arc welding of foils. using helium on the under side and argon on the top surface. Photographs. (K1, SS, Ti)

17-K. Design of Transformers for Resistance Welding Machines. D. L. Knight. *Electrical Engineering,* v. 72, Dec. 1953, p. 1088-1093.
Transformer design for resistance welding machines on basis of ratings, construction, impedance, efficiency, excitation and core loss, types of secondaries and insulating materials. Diagrams, photographs, graphs. 4 ref. (K3)

18-K. Point Shapes for Large Aluminium Rivets. D. A. Barlow and A. W. Brace. *Engineering,* v. 176, Oct. 23, 1953, p. 513-516.
Tests to determine optimum design in rivet-point shapes. Graph, photographs, tables, diagrams. 6 ref. (K13, Al)

19-K. Structural Failures in Welded Ships. *Industry & Welding,* v. 26, Dec. 1953, p. 39-42, 45.
Three basic factors (material, design and fabrication) involved in prevention of failures in welded structures. Photographs.
(K general)

20-K. Plug-In Sequence Timing Panel Reduces Spotwelding Maintenance Time. *Industry & Welding,* v. 26, Dec. 1953, p. 47-48, 78-79.
Designated a sequence-timing panel, this electronic device tells the spotwelder what to do and when to do it. Photographs. (K3)

21-K. Rapid Transit Track Maintenance Cut 30 Percent by Thermit Welding. Charles Berka. *Industry & Welding,* v. 26, Dec. 1953, p. 50-52, 54.
Includes photographs. (K4)

22-K. Silver Brazed Cutting Tools Withstand Shock and Vibration. *Industry & Welding,* v. 26, Dec. 1953, p. 66-68, 70, 72-73.
Induction brazing has many advantages when volume warrants the extra equipment. Diagrams, photograph. (K8, Q6, Q9)

23-K. Use Inert Arc Welding for Smooth, Even Joints. *Industry & Welding,* v. 26, Dec. 1953, p. 74-76, 78.
Another example of how a fabricator—by studying the specialized needs of an industry—can select a particular welding process and adapt it to build a product that fits those needs exactly. Photographs. (K1)

24-K. The Electric Resistance Welding Process for Making Steel Tubes. J. S. Blair. *Institute of Welding, Transactions,* v. 16, Oct. 1953, p. 117-126.
Earlier methods and new process including equipment, plant layout and operating procedures. Diagram, photographs. (K3)

25-K. Shrink Fits. Holding Power Can Be Increased. Bernard Trock. *Iron Age,* v. 172, Nov. 12, 1953, p. 175-177.
Surface finish, radial pressures and time have been found to be important factors in the holding power of shrink fits. Tables, graph, diagrams. (K13)

26-K. Some Practical Pointers on Silver Alloy Brazing. Sam McCaulley. *Metal Progress,* v. 64, Dec. 1953, p. 161-162, 164.
Techniques for making satisfactory and economical joints. Advantages and properties of typical joints. (K8, Ag)

27-K. Finishes for Soft Soldering Refractory Materials. E. E. Halls. *Product Finishing,* v. 6, Nov. 1953, p. 68-73, 108, 110.
Methods for producing suitable electroplate finishes for soldering on components of refractory materials. Tables. (K7)

28-K. Over 6,000 Cylinder Heads Reclaimed by Welding. *Railway Locomotives and Cars,* v. 127, Dec. 1953, p. 52-57, 60-61.
Abstract of a committee report of the Master Boiler Makers' Association, Sept. 15, 1953, at the Associations' annual meeting at Chicago. Photographs. (K general, Al)

29-K. Pick the Right Arc Welding Method. Thomas H. Hruby. *Steel,* v. 133, Nov. 23, 1953, p. 84-87.

Compares welding by coated electrode, submerged arc, or inert-gas shielded arc methods. Photographs, table. (K1)

30-K. Printed-Wiring Multiple Soldering Methods. Alvin E. Stones. *Tele-Tech,* v. 12, Dec. 1953, p. 62-64, 160, 163.

Modified double-pot and single-pot processes which provide low circuit board reject rate. Selection of materials and prevention of warpage, blistering and bridging. Photographs, table. (K7)

31-K. Argon-Arc Welding of Copper and Copper Alloys. Edwin Davis and E. A. Taylor. *Welding and Metal Fabrication,* v. 21, Nov. 1953, p. 418-423.

Results of welding trials. Photographs, tables. 4 ref. (K1, Cu)

32-K. Gas or Arc Welding for Cast Iron? T. J. Palmer. *Welding and Metal Fabrication,* v. 21, Nov. 1953, p. 436-439.

Preparation of casting, effect of heat on cast iron, preheating and other factors to be considered in welding cast iron. Photographs, table. (To be continued.) (K1, K2, CI)

33-K. Spot Welding of Titanium-Carbon Alloys. E. F. Holt, F. H. Vandenburgh and N. L. McClymonds. *Welding Journal,* v. 32, Nov. 1953, p. 1057-1066.

Investigation on spot welding of titanium-carbon alloys containing 0.1, 0.4 and 0.6% carbon in sheet thicknesses of 0.038-0.047 in. Surface preparation, physical properties and welding conditions. Photographs, tables. (K3, Ti)

34-K. The Human Element in Welding. Richard C. Wiley. *Welding Journal,* v. 32, Nov. 1953, p. 1066-1070.

Present shortage of welding engineers. Suggests corrective measures including expanding public relations, using engineering personnel to more advantage making in-service plant training count, and calling upon education to a greater extent. Photographs, diagrams. (K general, A3, A6)

35-K. The Brazing of Titanium. N. A. DeCecco and John M. Parks. *Welding Journal,* v. 32, Nov. 1953, p. 1071-1081.

Methods of making brazed joints, development of fluxes and preliminary investigations on recrystallization welding. Diagrams, micrographs, tables. 9 ref. (K8, Ti)

36-K. Some Recent Advances in the Welding of Molybdenum. W. H. Kearns, H. B. Goodwin, E. Eichen and D. C. Martin. *Welding Journal,* v. 32, Nov. 1953, p. 1082-1088.

To secure ductile welds, it is necessary that the faying surfaces of specially purified molybdenum be cleaned carefully and the welding be done in high vacuum. Tables, micrographs, photographs. 20 ref. (K general, Mo)

37-K. Welding for Low-Temperature Service. Robert W. Bennett. *Welding Journal,* v. 32, Nov. 1953, p. 1089-1097, 1099-1101.

Properties of various weld metals and base materials used in the fabrication of pressure vessels and heat exchangers for low-temperature service; tests used for their evaluation. Tables, graphs, micrographs. (K general, Q general, CN, AY, EG-a)

38-K. ABC's of Pipe Cutting and Welding. D. A. Spaulding. *Welding Journal,* v. 32, Nov. 1953, p. 1100-1101.

Procedures in oxy-acetylene cutting and welding. Photographs. (K2, G22)

39-K. The Self-Adjusting Arc—Improved Power Sources. J. C. Needham, W. G. Hull and L. H. Orton. *Welding Research,* v. 7, Oct. 1953, p. 100r-102r.

Mechanism of arc-length control in the self-adjusting arc, particularly the effect of output characteristics of the power source on degree of self-adjustment of arc lengths. Diagrams, graphs. 1 ref. (K1)

40-K. Vanadium-Bearing High Tensile Weldable Steels. *Welding Research,* v. 7, Oct. 1953, p. 103r-107r.

Report of research work on possible replacement of molybdenum by vanadium for high-tensile steels. Tables, photographs. 2 ref. (K9, P general, Q general, AY)

41-K. Weldability of Twelve Low-Alloy Steels Containing Vanadium. B. J. Bradstreet. *Welding Research,* v. 7, Oct. 1953, p. 107r-110r.

Experimental studies to determine susceptibility to hard-zone cracking. Tables, diagram, photograph. 3 ref. (K9, AY)

42-K. Triple-Projection Welding of Deep Drawing Mild-Steel Sheet. J. E. Roberts. *Welding Research,* v. 7, Oct. 1953, p. 111r-114r.

Experimental studies including description of welding machine, materials, specimen type and testing methods. Tables, diagrams, graph. 2 ref. (K3, CN)

43-K. Welded Fabrication Method Gives Time, Weight Savings on Giant Gear. Everett W. Sturdy. *Western Metals,* v. 11, Nov. 1953, p. 59-60.

Equipment and technique. Saving in time and cost. Photographs. (K general)

44-K. (Book.) **The Inert-Gas-Shielded Metal Arc Welding Process.** W. H. Woodling. American Welding Society, 39 West 39th Street, New York 18, N. Y. $1.00.

Development of the process, equipment required, and necessary controls and their function. Operation instructions and safety precautions are also presented. (K1)

45-K. Modern Welding Technique. XX. Miscellaneous Non-Ferrous Alloys. E. T. Gill and Eric N. Simons. *Edgar Allen News*, v. 32, Nov. 1953, p. 253-254.

Methods of welding nickel, nickel alloys, magnesium and magnesium alloys. Tables. (To be continued.) (K general, Mg, Ni)

46-K. Fully Automatic Production of Resistance-Welded Wire Mesh. H. Wedl. *Engineers' Digest*, v. 14, Nov. 1953. p. 417-419. Translated from *Draht (German Ed.)*, June, 1953, p. 205-211.

Design and construction of automatic equipment which includes automatic feeds to and from the machine. Graphs, diagrams. (K3, CN)

47-K. Welding Research in British Merchant Shipbuilding. R. B. Shepheard. *Engineering*, v. 176, Nov. 13, 1953, p. 639.

Notch properties and tests. (K general, Q23, ST)

48-K. Thermit Welding of Rolling Mill Pinions. John C. Querido, Jr. *Engineering Journal*, v. 36, Nov. 1953, p. 1468-1471.

Thermit welding theory. Process of welding new wobbler ends on drive pinions. Safety precautions. Photographs, tables. (K4)

49-K. Training Pipe Welders. R. D. Berry. *Heating, Piping & Air Conditioning*. v. 25, Dec. 1953, p. 94-96.

Journeymen pipefitters learn welding under program developed through cooperation for benefit of entire piping industry. Photographs. (K general, A6)

50-K. Jigs and Fixtures Increase Welding Output. Thomas J. Wood. *Iron Age*, v. 172, Dec. 10, 1953, p. 138-141.

Design and use for holding multicomponent assemblies. Photographs. (K general)

51-K. Proper Technique Gives Stainless Good Weldability. Roy E. Solomon. *Iron Age*, v. 172, Dec. 10, 1953, p. 142-144.

Relatively low current, small diameter rod and stringer bead technique produce best welds. Short arc provides better weld zone protection and results in superior corrosion resistance and appearance. Preheating benefits crack-sensitive stainless steels and helps all types during cold weather. Diagram, photographs, table. (K9, SS)

52-K. Inert Gases Prevent Oxidation, Speed Welding of Magnesium. R. L. Nelson. *Iron Age*, v. 172, Dec. 10, 1953, p. 145-147.

Arc and spot welding of magnesium alloys. Includes effect of aluminum on weldability; tensile strength of welds; comparison of butt, fillet and lap joints; and comparison of ac vs. dc current. Photograph, diagram. (K1, K3, K9, Mg)

53-K. Force Fit Improves Brazed Aluminum Joints. Bruce E. Brennan. *Iron Age*, v. 172, Dec. 10, 1953, p. 148-149.

New technique of joining aluminum tubes which combines force fitting and brazing. Photograph. (K8, K13, Al)

54-K. Inconel: Which Welding Process Fits Your Job? K. M. Spicer. *Iron Age*, v. 172, Dec. 10, 1953, p. 150-152.

Factors involved in choosing a welding method for a given application. Tabulates minimum mechanical properties to be expected for various methods. Photographs, table. (K general, Q general, Ni)

55-K. The Iron Age Welding Rod and Electrode Charts. *Iron Age*, v. 172, Dec. 10, 1953, p. 153-158.

Tabulates suppliers and specifications of rods and electrodes for carbon and stainless steels, aluminum, copper, nickel and magnesium alloys. (K1, CN, SS, Al, Cu, Ni, Mg)

56-K. New Alloys Stop Corrosion in Silver-Brazed Type 430 Joints. J. J. Halbig, L. H. Grenell and G. H. Sistare. *Iron Age*, v. 172, Dec. 10, 1953, p. 159-163.

Most silver-brazed joints in Type 430 and other chromium-grade stainless steels are susceptible to separation under mildly corrosive conditions. Prevention depends on a nickel-rich layer over the area covered by the brazing alloy. Photographs, tables. (K8, SS)

57-K. Maintenance Welding Keeps Production Moving. W. G. Patton. *Iron Age*, v. 172, Dec. 10, 1953, p. 168-171.

Procedures at Ford Motor Co.'s River Rouge plant. Machine repair, rebuilding shafts and conveyor hooks. Photographs. (K general)

58-K. Precontrol Aids Resistance Weld Uniformity, Quality. Myron Zucker. *Iron Age*, v. 172, Dec. 10, 1953, p. 172-176.

Planning of setups and coordination of procedures for spot and projection welding. Table. (K3)

59-K. Welding Operations at Fruehauf Trailer. Fred W. Vogel. *Modern Machine Shop,* v. 26, Dec. 1953, p. 136-141.

Automatic spot and seam welding equipment, plant layout and operating procedures. Photographs. (K3)

60-K. Adhesives Advance. II. Metal-to-Metal Bonding. George Epstein. *Modern Plastics,* v. 31, Dec. 1953, p. 93-96, 202, 205, 206.

Advantages of adhesive joining, theory of adhesion, adhesives and design considerations. Photographs. (K12)

61-K. Arc Welding With Melting Electrodes in a Protective Gas Atmosphere. K. V. Lyubavskyi and N. M. Novozhilov. *South African Mining and Engineering Journal,* v. 64, pt. 2, Oct. 31, 1953, p. 317.

Translated from *Avtogennoe Delo,* January 1953, p. 4-8. Principle and advantages of process. (K1)

62-K. The Welding of Nickel Alloy Steels. I. *Steel Processing,* v. 39, Nov. 1953, p. 573-580, 611.

Arc welding of high-strength, low alloy steels, and low, medium, and high-carbon types of nickel steels. Tables, diagrams, photographs. 6 ref. (K1, AY)

63-K. Copper-Gold Brazing Done Under Glass. Fred M. Burt. *Welding Engineer,* v. 38, Dec. 1953, p. 60-61.

Induction brazing of small assemblies in a hydrogen atmosphere. Photographs. (K8, Cu, Au)

64-K. (French.) **Weldability of Steel.** *Fonderie,* 1953, Oct., no. 93, p. 3639-3652.

Studies of weldability of laminated elements, laminated elements with forged or punched pieces and molded steel. Diagrams, tables, graphs, photographs. (K9, AY)

65-K. (German.) **Oxy-Acetylene Welding of Aluminum Materials.** *Schweisstechnik,* v. 7, no. 10, Oct. 1953, p. 109-113.

General procedure, fluxes, gas mixture, flame adjustment, types of joint and subsequent treatment of welded Al and Al alloys. Tables, diagrams. (K2, Al)

66-K. (German.) **Brazing Cast Aluminum.** *Schweisstechnik,* v. 7, no. 10, Oct. 1953, p. 118-119.

General procedure and its application to the automobile industry. (K8, Al)

67-K. (Russian.) **Contact Welding of Roofs of All-Metal Railroad Passenger Cars.** V. V. Vershinskii, I. A. Morozov, A. V. Meier and P. B. Pankratov. *Vestnik Mashinostroeniia,* v. 33, no. 8, Aug. 1953, p. 82-86.

Special equipment described. Photographs, diagrams. (K1)

68-K. Problems of Fabrication and Erection in All-Welded Multi-Storey Framed Buildings. D. C. C. Dixon. *Engineer,* v. 196, Dec. 4, 1953, p. 749-751.

Compares cost and weight of welded and riveted structures. Tables, diagrams. (K general)

69-K. Foundry Repair Welding. C. T. Williamsen. *Foundry,* v. 82, Jan. 1954, p. 204.

Reports salvaging of many defective castings through new welding methods and materials. Photographs. (K general, E general)

70-K. Copper and Silver Brazing Simplify Joining of Complicated Parts. L. F. Klein. *Materials & Methods,* v. 38, Dec. 1953, p. 108-109.

Combination of proper brazing techniques and simple shapes improves efficiency in production of small, complicated parts and permits use of dissimilar metals. Photographs. (K8)

71-K. Weldability of Steel as it Is Considered by Swiss Engineers. Charles G. Keel. *Metal Progress,* v. 65, Jan. 1954, p. 89-93.

Swiss specifications dealing with electrodes and weldable steels for penstocks, bridges, sluice gates and other massive objects working under high stresses. Photographs, tables. (K9, CN)

72-K. Welding and Efficient Maintenance. C. W. Brett. *Mine & Quarry Engineering,* v. 19, Dec. 1953, p. 461-465.

Modern applications of scientific welding discussed from standpoint of repair and strengthening of fractured plant. Photographs. (K general)

73-K. Observations on "Weak Laps" in Tinplate Can Bodies. W. E. Hoare and J. P. Gustin. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1042-1047, 1061.

Properties of tinplate which may be considered to affect seam performance. Observations on mechanical operations of body forming and on soldering operation proper also made. Photographs, tables. (K7, Q general, Sn)

74-K. The Gun That Shoots Handles. Eleanor Harvill. *Steelways,* v. 9, Dec. 1953, p. 18-19.

New applications and advantages of stud welding. Photographs. (K1)

75-K. A New Approach to Stitch Welding. *Welding and Metal Fabrication,* v. 21, Dec. 1953, p. 448.

Machine which allows speeds as high as 300 welds per minute. Photograph. (K3)

76-K. Fabricating Switchgear by Welding. *Welding and Metal Fabrication,* v. 21, Dec. 1953, p. 449-456.

Shop facilities and procedures. Photographs. (K general)

77-K. Welded Steel Fireboxes. *Welding and Metal Fabrication,* v. 21, Dec. 1953, p. 457-460.

Fabrication of locomotive fireboxes. Photographs. (K general, CN)

78-K. Electronic Welding Controls. C. R. Bates. *Welding and Metal Fabrication,* v. 21, Dec. 1953, p. 467-468, 474.

Advantages in use of controls. Various types, including program and slope controls. Diagram. (K1, K3)

79-K. Repair Welding of Ceramic-Coated Alloys. J. M. Riordan. *Welding Journal,* v. 32, Dec. 1953, p. 1160-1166.

Laboratory tests indicate procedures for field repairs of several alloys for high-temperature aircraft application. Table, photographs, micrographs, 5 ref. (K general, SG-h)

80-K. Inert-Tungsten Arc Welding of Stainless Steel Piping. F. J. Pilia. *Welding Journal,* v. 32, Dec. 1953, p. 1167-1174.

With suitable precautions and proper techniques it is possible to produce a surface on the inside of the pipe joint that is smooth and free from obstructions and notches. Photographs, diagrams. (K1, SS)

81-K. Spot Welding of Aluminum, Aluminum Alloys and Steel. W. J. Wilson. *Welding Journal,* v. 32, Dec. 1953, p. 1175-1180.

Results of tests of establish welding techniques and schedule which will produce satisfactory welds with special emphasis on the three variables: force, time and current. Graphs, photograph, diagram, micrographs. (K3, Al, ST)

82-K. Quality Control in Spot Welding Aluminum. Floyd H. Matthews. *Welding Journal,* v. 32, Dec. 1953, p. 1181-1194.

Equipment, processes and records. Photographs, charts, check sheets, graphs, tables. (K3, Al)

83-K. Welded Arch Bridge Over the Rio Blanco River in Mexico. Thomas C. Kavanagh and Camilo Piccone. *Welding Journal,* v. 32, Dec. 1953, p. 1195-1202.

Erection of a 250-ft., all-welded, splayed-arch bridge of unprecedented design. Photographs, diagram. (K general)

84-K. Stabilizing Austenitic Chrome-Nickel Weld Metal Against Intergranular Corrosion. Hallock C. Campbell. *Welding Journal,* v 32, Dec. 1953, p. 577s-584s.

22% Cr, 10% Ni electrode proposed as a substitute for usual columbium addition for protection against intergranular attack. Tables, diagram, micrographs, graphs. 4 ref. (K1, R2, SS)

85-K. Low-Temperature Bend Test Properties of Bead-on-Plate Welds. L. A. Harris, R. B. Matthiesen, and N. M. Newmark. *Welding Journal,* v. 32, Dec. 1953, p. 585s-599s.

Tests on welds of low-hydrogen and cellulosic-type electrodes with and without pre and post-heating. Photographs, diagrams, graphs, tables, micrographs. 6 ref. (K1, Q5)

86-K. (German and French.) **Welding and Soldering in Metal Fabrication.** F. Ulrich. *Zeitschrift für Schweisstechnik,* v. 43, no. 8, Aug. 1953, p. 147-152, 154-157.

Fabrication of useful and artistic metal articles. Photographs, diagram. (K general)

87-K. (German and French.) **A New Oxy-Acetylene Welding Torch. New Possibilities for Electric Welding.** Rudolf Weber and Max Maier. *Zeitschrift für Schweisstechnik,* v. 43, no. 11, Nov. 1953, p. 209-216.

Causes of flashback. Describes new torch which is insensitive to heat. Photographs, graphs. (K2)

88-K. (German and French.) **Research on Operating Behavior of the Dry Generator ATE 50 N.** C. Keel and P. Hartmann. *Zeitschrift für Schweisstechnik,* v. 43, no. 10, Oct. 1953, p. 195-200; no. 11, Nov. 1953, p. 216-218, 220-221.

Causes of disturbances and accidents with acetylene generators. Design and operating principles. Tables, diagrams. (To be continued.) (K2)

89-K. (German and French.) **Weld Spattering in Oxy-Acetylene and Electric Welding.** C. Keel and H. P. Siegenthaler. *Zeitschrift für Schweisstechnik,* v. 43, no. 11, Nov. 1953, p. 222-226.

Study on number, shape and size of spatter particles. Importance of precautions against fire. Diagrams, tables, photographs. (K2, K1)

90-K. (Russian.) **New Electric Welding Methods.** V. I. Popov. *Nauka i Zhizn,* v. 20, no. 7, July 1953, p. 5-7.

Automatic welding operations with rods up to 60 mm. in size. Special hydraulic drive secures hydraulic compression of 25 to 30 tons. Application of method increased efficiency seven to eight times. Photographs, diagrams. (K6)

91-K. (Russian.) **Investigation of Welding Sheet Cast Iron.** A. Z. Blitshtein and S. M. Lashchiver. *Sel'khozmaschina,* 1953, no. 11, Nov., p. 19-23.
Production and use of cast iron-to-steel weldments in agricultural machinery. Tables, diagrams, micrographs. (K general, CI, ST)

92-K. (Spanish.) **Design for Welded Construction.** F. Koenigsberger. *Ciencia y técnica de la Soldadura,* v. 111, no. 14, Sept.-Oct. 1953, 14 p.
Calculation of stresses and load capacity of weldments. Diagrams, tables, graphs. (K general, Q25)

93-K. (Spanish.) **The Problem of Rupture in Welded Ships.** E. Vollbrecht. *Ciencia y técnica de la Soldadura,* v. 111, no. 14, Sept.-Oct. 1953, 8 p.
Special rules to be observed in construction of welded hulls. Diagrams. (K9)

94-K. (Spanish.) **Bronze Welding of Cast Iron.** *Fusion de Metales,* v. 16, no. 5, Nov.-Dec. 1953, p. 6-9.
Principles, advantages and limitations. Diagrams. (K8, CI)

95-K. **Sheet-Metal Welding. III. Application of the Pantograph Principle to the Argon-Arc Welding of Gas-Turbine Assemblies.** *Aircraft Production,* v. 15, Dec. 1953, p. 470-477.
Includes photographs, diagrams. (K1)

96-K. **New Mill Induction Welds Aluminum Tubing.** T. M. Rohan. *Iron Age,* v. 172, Dec. 17, 1953, p. 129-131.
Cost of induction welded tubing produced on the new mill is below that of extruded tubing of similar quality and is available in a wider range of alloys and in tempers from dead soft to full hard. Photographs, tables. (K6, Al)

97-K. **Welding Aluminum Sheet.** *Linde Tips,* v. 33, Jan. 1954, p. 5-9.
Preparations for welding, preheat temperatures and control of weld puddles. Photographs, diagrams. (K general, Al)

98-K. **How to Handle a Heliarc Torch.** *Linde Tips,* v. 33, Jan. 1954, p. 14-15.
Procedures for inert-gas shielded arc welding. Photographs. (K1)

99-K. **Oxy-Acetylene Welding for Lengthening the Life of Wearing Parts With Bronze, Cast Iron and Steel Welding Rods.** *Linde Tips,* v. 33, Jan. 1954, p. 16-17.
Tabulates procedures for resurfacing worn parts.
(K2, L24, Cu, CI, CN, SS)

100-K. **Correct Welding Procedure. V.** Lester F. Spencer. *Sheet Metal Worker,* v. 45, Dec. 1953, p. 62-64.
Welding of aluminum-base alloys by carbon-arc, atomic hydrogen, and resistance methods. Tables. (To be continued.) (K1, K3, Al)

101-K. **Weldability of Structural Steel.** E. L. Erickson. *Welding Journal,* v. 32, Dec. 1953, p. 1155-1159.
Requirements and development of steels for ships, buildings and bridges from standpoint of government specifications and use. Tables. (K9, SS)

102-K. **Tension, Shear and Impact Strengths of Spot-Welded Titanium Joints.** M. L. Begeman, E. H. Block, Jr., and Frank W. McBee, Jr. *Welding Journal,* v. 32, Dec. 1953, p. 599S-604S.
Physical properties necessary for the design of spot welded joints in commercially pure titanium sheet. Tables, photograph, graphs. 13 ref. (K3, Ti)

103-K. **Effect of Nitrogen and Caron Dioxide Atmospheres on Arc Welding.** F. W. Sowa, W. C. Truckenmiller and L. E. Wagner. *Welding Journal,* v. 32, Dec. 1953, p. 619S-624S.
Effect of surrounding atmosphere on formation, precipitation and distribution of oxide and nitride constituents. Tables, photographs, micrographs. (K1)

104-K. **New High Speed Tube Mill at Kaiser Induction-Welds Aluminum Tubing.** *Western Metals,* v. 11, Dec. 1953, p. 50-51.
Equipment, plant layout and operating procedures. Photographs. (K6, Al)

105-K. (Book.) **Quasi-Arc Welding Manual.** 2 Ed. Quasi-Arc Co., Bilston, Staffordshire, England. 7s. 6d.
Techniques of welding mild steel and other materials. Welding practices, plants, and equipment. Illustrations. (K1)

106-K. **Spot Welding Aluminum. I.-III.** *American Machinist,* v. 98, Jan. 4, 1954, p. 123, 125, 127.
Three data sheets. (K3, Al)

107-K. **Welding Problems in the Construction of a Modern Boiler Plant.** F. L. Dingle. *Australasian Engineer,* 1953, Nov., p. 46-51.
Paper from Welding Engineering Symposium, Sydney, Nov. 1953. High pressure and temperature considerations in steam generator construction. Photographs, diagrams. (K general)

108-K. **Automatic Welding Lines for Fisher Body Components.** Thomas MacNew. *Automotive Industries,* v. 110, Jan. 1, 1954, p. 56-59.
Progress made by one of today's largest users of welding automation. Photographs, diagram. (K general)

109-K. **Inert Gas Welding Applied to Pipe and Tubing.** R. E. Lorentz,

Jr. *Combustion,* v. 25, Dec. 1953, p. 41-45.

General information concerning one of the newer welding processes as used in the welding of pipe and tubing. Inert-gas welding processes are widely used in many more applications than those discussed. Photographs. (K1, CN, SS)

110-K. Modern Welding Technique. XX. Miscellaneous Non-Ferrous Alloys. XXI. The Metallurgy of Steel Welding. E. T. Gill and Eric N. Simons. *Edgar Allen News,* v. 32, Dec. 1953, p. 273-274.

Preparation of surfaces, techniques of resistance welding and repair of castings for magnesium and its alloys. General remarks regarding welding of steel. (To be continued.) (K general, ST, Mg)

111-K. Plate-Girder Bridges. G. Roberts and O. A. Kerensky. *Engineer,* v. 196, Dec. 11, 1953, p. 786-788.

Indicates lines that a design should follow to achieve real economy in welded structures. Graph, table, diagrams. (K general, T26, ST)

112-K. Weld Aluminum Die Castings With Inert Arc Process. Robert Haslip. *Industry & Welding,* v. 27, Jan. 1954, p. 33-36.

Selection of proper welding process and development of correct welding techniques. Photographs. (K1, Al)

113-K. A Guide to Pipe Welding Layout. II. Dorsey B. Thomas. *Industry & Welding,* v. 27, Jan. 1954, p. 38-40, 42.

Methods accumulated after years of experience. Diagrams. 1 ref. (K general)

114-K. Use All-Welded Trusses for Freedom in Plant Design. *Industry & Welding,* v. 27, Jan. 1954, p. 45-47, 64.

Reduced weight and increased rigidity of H-type trusses. Photographs. (K general, T26)

115-K. How to Use Hot Pressure Welding. *Industry & Welding,* v. 27, Jan. 1954, p. 50-52, 55-57.

Includes photographs. (K2)

116-K. Weld Cast Iron With Minimum Heat. *Industry & Welding,* v. 27, Jan. 1954, p. 58, 60.

Glass container molds that develop flaws during manufacture can be easily repaired without preheating the entire mold. Photograph, diagram. (K general, CI)

117-K. How to Align Shafts for Welding. *Industry & Welding,* v. 27, Jan. 1954, p. 62, 64.

Set-up used in welding an extension to a conveyer roller shaft. Diagram. (K general)

118-K. Transformer Induction Fixtures Speed Brazing. *Metal-Working,* v. 10, Jan. 1954, p. 6-7.

Two-sided coil brazes joint without distorting pulley web. Photographs, diagram. (K8)

119-K. Scientific and Practical Welding Repairs. C. W. Brett. *Overseas Engineer,* v. 27, Jan. 1954, p. 216-217.

Modern principles and methods. Photographs. (K general)

120-K. Poor Welds Can Start Brittle Fracture. F. J. Feely and M. S. Northup. *Steel,* v. 134, Jan. 11, 1954, p. 100-101.

Welding defects and improper repairs led to complete failure of two storage tanks in English refinery. Photographs, diagram. (K general, Q26)

121-K. Cascade System for Argon Gas. William P. Brotherton. *Western Machinery and Steel World,* v. 44, Dec. 1953, p. 92-93.

Changing from individual tanks to a central system resulted in considerable saving in welding time and bottle handling. Photographs. (K1)

122-K. Waxless Thermit Welding Needs no Preheat. *Welding Engineer,* v. 39, Jan. 1954, p. 26-27.

Welding operations in construction of the Tappan Zee bridge. (K4, T26)

123-K. Refrigerator Plant of Tomorrow. Clyde B. Clason. *Welding Engineer,* v. 39, Jan. 1954, p. 28-31.

New ideas, layout, techniques, skills and many new production welding tools. Photographs. (K general, T27, Al, ST, Cu, SS)

124-K. Big Job for Welded Steel. Van Rensselaer P. Saxe. *Welding Engineer,* v. 39, Jan. 1954, p. 34-35.

Use of welded connections and continuity design which saved 135 tons of steel in construction of new 14-story Broadview Apartments. Photographs, diagrams. (K general, T26, ST)

125-K. How to Build a Fixture. Roger Isetts. *Welding Engineer,* v. 39, Jan. 1954, p. 38-39.

Provision for access to the work, selection of clamps, location of work and spatter prevention. Diagrams, photographs. (K general)

126-K. Mig Welding on Minesweepers. John Gowan. *Welding Engineer,* v. 39, Jan. 1954, p. 40-42, 46.

Metal inert gas welding operations on aluminum-bronze rudders and aluminum cable reels. (K1, Al, Cu)

127-K. Flux Backings in the Submerged Arc Welding of Vessels. I. N. Gerasimenko. Henry Brutcher, Altadena, Cal., Translation no. 2999, 3 p.

+ 1 plate. (From *Avtogennoe Delo,* v. 20, no. 5, 1949, p. 16-17.)
Previously abstracted from original. See item 22B-392, 1949. (K1)

128-K. (French and German.) **Radiant Heating.** H. Weilmann. *Zeitschrift für Schweisstechnik,* v. 43, no. 12, Dec. 1953, p. 233-236.
Principles of radiant heating. Installation and welding of pipes for radiant-heating systems. Photographs. (To be continued.) (K general, T27, ST)

129-K. (French.) **Techniques of Repairing Hydraulic Turbines by Welding and Associated Processes at the Electricité de France.** J. Narcy and R. Kermabon. *Soudure et Techniques connexes,* v. 7, nos. 11-12, Nov.-Dec. 1953, p. 265-278; disc., p. 278-281.
Repairing techniques depending on type of wheel, wear characteristics and chemical composition of metal. Operating methods and chemical composition of electrodes used. Photographs, tables. (K1, CN, SS, Cu)

130-K. (French.) **Rate of Fusion of Arc-Welding Electrodes.** J. ter Berg and A. Larigaldie. *Soudure et Techniques connexes,* v. 7, nos. 11-12, Nov.-Dec. 1953, p. 285-290; disc., p. 290.
Various factors influencing specific rate of fusion of electrodes by arc welding. Chemical composition of coatings. Graphs, diagrams, table, photographs. 7 ref. (K1)

131-K. (German.) **Calculation of Welded Design for Static Load.** K. H. Effertz. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 394-400.
Mathematics for welded parts subjected to various types of static stresses. Graph, table, diagrams. 8 ref. (K general, Q25)

132-K. (German.) **Calculation of Welded Joints for Variable Stress.** A. Erker. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 400-417.
Change of stress with time, notch effects, calculation of fatigue strength, effect of irregular stresses, permissible stress and safety factors, butt, spot, seam, and fusion welding, strap joints and details of weld design. Tables, diagrams, graphs, photographs. 54 ref. (K general, Q25)

133-K. (German.) **Mutual Effect Between Welding Process and Weld.** Walter Schulze. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 417-423.
Principles of different welding methods and various types of joints and seams. Tables, graphs, diagrams. (K general)

134-K. (German.) **Welded Corner Joints in Machine-Construction.** Walter Schulze. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 424-427.
Type and magnitude of stress, welding method and economic factors must be considered in design of welded corner joints. Diagrams, graphs. (K general, Q25)

135-K. (German.) **Welded Flanges, Reinforcements, and Nozzles.** E. Wiese. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 427-429.
Different methods of attaching nipples and other structural parts to heavy steel plate. Diagrams. (K general, ST)

136-K. (German.) **Pipe Joints in Structural Steelwork.** H. Böhden and A. Köhler. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 429-432.
Different methods of joining pipe of different and equal diameters. Diagrams. 2 ref. (K general, ST)

137-K. (German.) **Welded Pipe-Joints.** H. Jansen. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 432-435.
Design of different joints. Photographs, diagrams, graph. 4 ref. (K general)

138-K. (German.) **Design of Hinged Connections for Structural Members.** H. Heitzer. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 436-440.
Numerous designs of mono and multilateral hinge fittings. Diagrams. (K general)

139-K. (German.) **Welded Corners of Frames.** H. Schulz and K. H. Kenn. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 441-445.
Numerous intricate designs. Diagrams. (K general)

140-K. (German.) **Joints at Right Angles in Welded Constructions.** H. Kriesche. *Schweissen und Schneiden,* v. 5, no. 11, Nov. 1953, p. 445-455.
Numerous methods of joining sheet metal and structural steel at 90° angles. (K general)

141-K. (Hungarian.) **Brazing of Metals. I.** Istvan Varga. *Aluminium (Budapest),* v. 5, no. 10, Oct. 1953, p. 222-224.
Advantages, general principles, and various processes. Diagrams, photographs, table. (To be continued.) (K8)

142-K. (Hungarian.) **Brazing of Metals. III.** Istvan Varga. *Aluminium (Budapest),* v. 5, no. 12, Dec. 1953, p. 251-258.
Properties of various brazing metals. Adaptability of these metals to joining various materials. Correct design of joints. Tables, diagrams, graphs. 14 ref. (K8)

143-K. Welding in the Fabrication, Construction, and Erection of Power Station Steelwork. *Australasian Engineer,* 1953, Dec., p. 45-47, 72.

Paper no. 3 delivered before the Welding Engineering Symposium, Sydney, on Nov. 12, 1953. Design, fabrication, and weld construction. (K general, T26)

144-K. Cracking in Stainless and Heat-Resisting Weld Metals. H. F. Tremlett. *Institute of Welding, Transactions,* v. 16, Dec. 1953, p. 143-150; disc., p. 150-153, 174.

Develops idea that cracking in stainless and heat resisting welds may be prevented by proper choice of weld structure. Photographs, graphs, tables. (K9, SG-g, h)

145-K. Weldability of High Tensile Structural Steels. L. Reeve. *Institute of Welding, Transactions,* v. 16, Dec. 1953, p. 154-162; disc., p. 163-166.

Development of weldable high-tensile structural steels, including the standard steel and some details of higher yield point steels now commercially available. Graphs, tables, diagrams, photomicrographs. 12 ref. (K9, AY)

146-K. Induction Heater Boosts Output of Brazed and Soldered Parts. O. W. Noeske and W. F. Sickels. *Iron Age,* v. 173, Jan. 14, 1954, p. 116-117.

Induction heating for soft soldering and silver brazing five joints of a thermostatic diaphragm has cut costs, increased production, and reduced rejects. Diagram, photograph. (K7, K8)

147-K. Tooling and Welding Aft Frames at Ryan Aeronautical. *Machine and Tool Blue Book,* v. 49, Jan. 1954, p. 226-231.

Includes photographs. (K general, G general)

148-K. Shrink Fits. J. H. Faupel. *Machine Design,* v. 26, Jan. 1954, p. 114-124.

How increased efficiency of structural and machine parts can be more economically obtained by using materials in their optimum stressed conditions. Diagrams, graphs, tables. 6 ref. (K13, Q general)

149-K. Designing Ring Sections. Verne Wildman. *Machine Design,* v. 26, Jan. 1954, p. 149-152.

Use of flash welded rolled sections offers considerable savings in materials and production time. Photographs, diagrams, table. (K3)

150-K. Close Tolerance Aluminum Parts Brazed in Salt Bath. William J. Rudolph. *Materials & Methods,* v. 39, Jan. 1954, p. 96-99.

When properly done, dip brazing lowers unit cost, reduces scrap, and produces joints as strong as those by other methods. Photographs, diagram, table. (K8, Al)

151-K. The Determination of Droplet Size in Arc Welding by High-Speed Cinematography. P. D. van der Willigen and L. F. Defize. *Philips Technical Review,* v. 15, Oct. 1953, p. 122-128.

Films have been made of transfer of weld metal, with a camera taking up to 3000 frames per sec. Graph, diagrams, photographs, tables. (K1, CN)

152-K. 23 Ways to Attach Small Die Cast Parts. Hiram K. Barton. *Product Engineering,* v. 25, Jan. 1954, p. 198-202.

Diagrams and explanations. (K general, E13)

153-K. Spot Welding of Ferritic Chrome Steels. Hans Wängsjö. *Sheet Metal Industries,* v. 31, no. 321, Jan. 1954, p. 31-39.

Welding difficulties of this nickel-steel substitute. Photomicrographs, graphs, tables. (K3, SS)

154-K. Cold Pressure Welding of Titanium. J. E. Hughes. *Sheet Metal Industries,* v. 31, no. 321, Jan. 1954, p. 52-54, 60.

Cold welding as a possible industrial method for the fabrication of titanium components. Photograph, tables. 3 ref. (K5, Ti)

155-K. Stud Welding: Fastening Costs Down 30 Per Cent. *Steel,* v. 134, Jan. 18, 1954, p. 91.

Semi-automatic equipment which interjects mass production technique. Photographs. (K1)

156-K. Welding in the Atomic Energy Projects. I. H. Hogg. *Welding and Metal Fabrication,* v. 22, Jan. 1954, p. 2-14.

A complete discussion of welding processes used at a plant in Canada. Photographs, tables, diagrams. (K general, T25)

157-K. Structures for Atomic Defence. *Welding and Metal Fabrication,* v. 22, Jan. 1954, p. 22-27.

Welding used in construction of equipment for atomic apparatus. Photographs. (K general)

158-K. Aspects of Welding Research in British Merchant Shipbuilding. R. B. Shepheard. *Welding and Metal Fabrication,* v. 22, Jan. 1954, p. 28-32.

Welding research affecting shipbuilding undertaken in Great Britain during recent years. Diagrams, photographs. 19 ref. (K9, T22)

159-K. Inert-Arc Field Welding of Pressure Piping. R. T. Pursell. *Welding Journal,* v. 33, Jan. 1954, p. 41-46.

Use of paper disks as backing strips. Photographs, micrographs, diagrams, table. (K1, ST)

160-K. Optimum Spot and Seam Welding Conditions for Inconel "X". Ernest F. Nippes and Herbert B. Fishman. *Welding Journal,* v. 33, Jan. 1954, p. 1S-14S.
Determination of optimum conditions on basis of tension-shear, cross-tension, and pillow tests. Tables, micrographs, graphs. 8 ref. (K3, K9, Ni)

161-K. Moisture in Low-Hydrogen Welding Electrodes. C. DeRop and H. Schmidt-Bach. *Welding Journal,* v. 33, Jan. 1954, p. 39S.
Previously abstracted from *Stahl und Eisen.* See Item 704-K, 1953. (K1)

162-K. An Investigation of Welded Rigid Connections for Portal Frames. A. A. Toprac. *Welding Journal,* v. 33, Jan. 1954, p. 40S-56S; disc., p. 56S.
Tests of 11 typical knees used in welded single-span steel rigid frames. Evaluates each type and suggests improvements. Chart, diagrams, graphs, photographs, tables. 6 ref. (K general, T26)

163-K. Core Wires for Welding Electrodes. K. L. Zeyen. *Draht (English Ed.),* 1953, no. 17, Dec., p. 19-24.
Official regulations in various countries for core wires of bare and coated rods for arc welding of ferrous materials. Tables. 16 ref. (K1)

164-K. (Russian.) **Multi-Electrode Automatic Welding and Building up Under a Flux.** N. P. Emel'ianov, A. V. Obukhov, and D. A. Dul'chevskii. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 73-78.
Increased productivity of method. Diagrams, photographs, tables. (K1)

165-K. (Russian.) **Increasing Impact Strength of Gas Welds.** A. N. Shashkov, T. S. Khromova and S. S. Vaksman. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 8185.
High managense content in silicon steel welding rods was found to increase strength and plasticity of the weld. Tables, micrographs, graphs. 3 ref. (K2, Q6, Ti, AY)

166-K. (Russian.) **Cold Welding of Aluminum.** I. B. Baranov. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 86-89.

High productivity and simplicity. Permits joining of different metals. Diagrams, graphs, photographs, table. (K5, Al, Cu)

167-K. New Developments in Sigma Welding of Carbon Steels. I. From a paper by T. McElrath and R. T. Telford. *Canadian Metals,* v. 17, Jan. 1954, p. 38, 40-41.
Shielded inert-gas metal-arc welding was first applied mainly to nonferrous materials, but progress has been made in welding carbon steel. Tables, graph. (K1, CN)

168-K. The Electric Arc and the Welding Engineer. H. West. *Institution of Electrical Engineers, Proceedings,* v. 101, pt. 1, no. 127, Jan. 1954, p. 21-22.
Abstract of address delivered at Manchester, Oct. 1953. Problems which arise in electric welding. (K1)

169-K. Multipass Welding Increases Ductility. F. W. Myers, Jr. *Iron Age,* v. 173, Jan. 21, 1954, p. 104-105.
Refinement of weld grain structure by repetitive heating and cooling in multipass welding produces many desirable characteristics. Photograph, photomicrograph. (K6, CN)

170-K. Inert-Gas Welding Cuts Cost of SAE 1020 Dolly Wheels. D. V. Wilcox. *Iron Age,* v. 173, Jan. 28, 1954, p. 118-119.
Equipment and techniques of process. Photographs. (K1, CN)

171-K. Huge Casting Repaired by Sigma Welding Process. E. R. Stanson. *Modern Machine Shop,* v. 26, Feb. 1954, p. 194, 196.
Application of the "shielded inert-gas metal-arc" welding process in repairing a 6500-lb. aluminum casting. Photograph. (K1, Al)

172-K. Semiautomatic Welder Adapted to Magnetic Flux. R. A. Hand. *Oil and Gas Journal,* v. 52, Feb. 1, 1954, p. 88-89.
Design and operation. Photographs, diagram. (K1)

173-K. Increased Productivity With Carbides. II. Proper Brazing Techniques. Guy Monacelli. *Screw Machine Engineering,* v. 15, Feb. 1954, p. 51-52, 54.
Brazing of carbide tips to steel shanks. Photographs. (K8, G17)

174-K. The Welding of Nickel Alloy Steels. II. *Steel Processing,* v. 40, Jan. 1954, p. 39-47.
Equipment and techniques employed in various processes. Tables, graphs. 4 ref. (K general, AY)

175-K. 77 Years of Resistance Welding. I. Preston M. Hall. *Welding Engineer,* v. 39, Feb. 1954, p. 54-55.
Historical summary. Photographs. (To be continued.) (K3)

176-K. New Arc Welding Process for Cast Iron. K. K. Khrenov and F. S. Vol'fovskaya. Henry Brutcher, Altadena, Cal., Translation no. 2919, 10 p. (From *Avtogennoe Delo,* v. 23, no. 1, 1952, p. 3-6.)

Previously abstracted from the original. See item 477-K, 1952. (K1, Q5, CI)

177-K. (French.) **Welded Construction of Electric Locomotives.** P. Fromaget. *Revue de la Soudure (Brussels),* v. 9, no. 4, 1953, p. 157-168.

Problems of welding locomotive frames. Remedial measures. Photographs, diagrams. (K general, T23)

178-K. (French.) **Code Project for the International Symbolization of Coated Electrodes for Arc Welding of Mild Steels and Low-Alloy High-Strength Steels.** *Revue de la Soudure (Brussels),* v. 9, no. 4, 1953, p. 179-183.

Classification consists of degree of penetration, mechanical characteristics and operating conditions. Diagrams, tables. (K1, AY, CN)

179-K. (Photocopy.) **Literature Review and Industrial Survey of Brazing.** Armour Research Foundation, for U. S. Army Ordnance Corps. 193 frames. June 1952. Available from Library of Congress, PB 112027, Washington 25, D. C. Microfilm $7.00. Enlargement Print $26.25.

A summary of information on all fundamentals of this method of joining ferrous and nonferrous metals. (K8)

180-K. (Pamphlet.) **Brazing Titanium to Titanium and to Mild and Stainless Steels.** Battelle Memorial Institute, for Wright Air Development Center. 38 p. Nov. 1952. Available from OTS, P.B. 111244, U. S. Dept. of Commerce, Washington 25, D. C. $1.00. (K8, Ti, SS)

181-K. (Book.) **Adhesives for Wood.** R. A. G. Knight. Royal Aeronautical Society Monographs on Metallic and Other Materials. v. III. 242 p. 1952. Chapman and Hall Ltd., 37 Essex St., London W.C. 2, England. $3.75

Deals with a particular aspect of the age-old problem of how to join components. Covers principally components made of wood but joining of wood to metals and plastics is also considered. (K12)

182-K. High-Temperature Brazing. G. D. Cremer, F. J. Filippi and R. S. Mueller. *Aircraft Production,* v. 16, Feb. 1954, p. 76-81.

Application of corrosion and heat resistant alloys to the fabrication of sheet-metal assemblies. Photographs. (K8)

183-K. Bonding Methods for Adhering Rubber to Metal. J. H. Gerstenmaier. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 11 p.

Types of adhesions, design features and a method for determining quality levels. Photographs, drawings, tables. (K11)

184-K. Manufacturing Applications for Metal Stitching. Arthur G. Denne. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 18 p.

Advantages, limitations and standard manufacturing applications. Photographs, drawings, table. (K13)

185-K. Properties, Processing and Uses of Metal-Bonding Adhesives. O. W. Loudenslager. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 13 p.

Physical properties and sandwich materials with their present and future uses. Photographs, drawings, tables. 9 ref. (K12)

186-K. Solid State Bonding of Aluminum to Nickel. S. Storchheim, J. L. Zambrow and H. H. Hausner. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 269-274.

Solid-state bonding of aluminum to nickel was studied as a function of temperature, pressure and time at pressure. Initial results indicated that as reaction conditions were varied, marked changes in tensile strength occurred. Diagram, graphs, photographs, micrographs. (K5, Q27, Al, Ni)

187-K. 6 Processes for Fusion Welding of Aluminum. Lester F. Spencer. *Welding Engineer,* v. 39, Feb. 1954, p. 58-62, 64, 66.

Oxy-acetylene, metal and carbon-arc, atomic-hydrogen, tungsten and metal inert-gas processes. Photographs, diagrams, tables. 12 ref. (K2, K1, Al)

188-K. (German.) **Fatigue Strength of Corner-Weld Joints.** *Brennstoff-Wärme-Kraft,* v. 6, no. 1, Jan. 1954, p. 22-24.

Experiments with four different types of joints. Photographs, diagrams, graphs. (K general, Q7)

189-K. (German.) **New Electric Welding and Soldering Gun.** J. C. Fritz. *Elektrotechnische Zeitschrift,* v. 6, Ausgabe B, no. 1, Jan. 21, 1954, p. 10.

Hard-soldering and argon and sigma-welding guns. Photograph. 5 ref. (K1, K7)

190-K. (German.) **Evaluation of the Progressive Technique of Spot Welding.** K. Ruppin. *Metall,* v. 8, nos. 1-2, Jan. 1954, p. 30.

Principles and weldability of different metals. Tables, graphs. (K3)

191-K. (German.) **Repairing Cast-Iron Parts by Welding.** Hans Höll.

Schweissen und Schneiden, v. 5, no. 12, Dec. 1953, p. 480-483.

Various methods of hard soldering and welding. Diagrams, photographs. (K7, K1, K2, CI)

192-K. (German.) **Electric Arc Welding Under Protection of Rare Gases.** Wilhelm Mantel and Lothar Wolff. *Schweisstechnik,* v. 7, no. 12, Dec. 1953, p. 133-142.

Advantages, procedure, equipment and application. Shows that a-c. welding with ordinary transformers is not satisfactory with this process. Tables, photographs, diagrams, graphs. (K1)

193-K. (German.) **Condenser-Impulse Welding.** Fr. Früngel and W. Thorwart. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 1, Jan. 1, 1954, p. 18-21.

Advantages, design and results. Photographs, diagrams, graphs. 2 ref. (K6, ST, Ag, Cu, Fe, W, Al)

194-K. (German.) **Inductive Welding of Pipe Seams and Its Application.** E. Hörmann. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 3, Jan. 21, 1954, p. 65-72.

Production and joining of pipes. Pressure and temperature requirements. Graphs, photographs, diagrams, micrographs. (K6)

195-K. Tests of Electric Flash Butt-Welded Rails. R. E. Cramer and R. S. Jensen. *American Railway Engineering Association, Bulletin,* v. 55, no. 514, Feb. 1954, p. 684-694.

Rolling-load and physical tests. Tables, photographs. (K3, CN)

196-K. New Developments in Sigma Welding of Carbon Steels. II. T. McElrath and R. T. Telford. *Canadian Metals,* v. 17, Feb. 1954, p. 34, 36, 38.

From paper presented at Annual Meeting of the AWS, 1953. Report covers three years of research, development and commercial exploitation of the sigma-process as applied to the welding of carbon steel. Tables, drawings. 3 ref. (K1, CN)

197-K. Atomic Hydrogen in the Research Laboratory. R. L. F. Boyd and N. D. Twiddy. *Electronic Engineering,* v. 26, Feb. 1954, p. 78-79.

Instrument employing a radiofrequency corona to produce dissociation in welding and brazing. Photographs, diagram. (K1, K8)

198-K. Vaporized Flux for Bronze Welding. *Machinery Lloyd (Overseas Ed.),* v. 26, Jan. 30, 1954, p. 107-108.

Method provides uniform and easily regulated flow of flux. Diagram. (K8, Cu)

199-K. Evolution of Hydrogen From Weld Metal. K. Winterton and C. L. M. Cottrell. *Metallurgia,* v. 49, no. 291, Jan. 1954, p. 3-7.

Hydrogen evolving at room temperature from freshly made steel weld metal can be measured by a simple displacement method. Values of evolved hydrogen are quoted for 19 electrodes. Photographs, tables, graphs. 4 ref. (K1, ST)

200-K. The Cold Pressure Welding of Metals. J. E. Hughes. *Metallurgia,* v. 49, no. 291, Jan. 1954, p. 15-19.

Using a method of cold welding cylindrical rod specimens in which deformation may be confined to interfacial zone, weldabilities of aluminum, copper and iron have been studied. Diagrams, tables, photograph, micrographs. 7 ref. (K5, Al, Cu, Fe)

201-K. Shielded-Tungsten Arc Welding. H. A. Huff, Jr., and A. N. Kugler. *Product Engineering,* v. 25, Feb. 1954, p. 170-174.

Equipment, jigging, shielding gases, joint design and various weldable metals. Photographs. (K1)

202-K. The Use of Solder Paint in Container Manufacture. G. Taylor. *Sheet Metal Industries,* v. 31, no. 322, Feb. 1954, p. 123-124, 128.

A strip of paint 1/16 in. wide applied where required provided enough solder to sweat the side seam of a can. Drawings. (K7)

203-K. The Twin-Arc Welding Process. W. D. Waller. *Sheet Metal Industries,* v. 31, no. 322, Feb. 1954, p. 131-135.

Fast, low-cost process to meet initial high costs of automation. Tables, photographs, diagram. (K1)

204-K. Sigma Welding of Carbon Steel. T. McElrath and R. T. Telford. *Steel,* v. 134, Feb. 22, 1954, p. 104-106.

From a paper presented at the Annual Meeting, AWS, Fall, 1953. With porosity problems well on the way to solution, inert-gas metallic-arc process stands to move more rapidly into fields dominated by coated-electrode welding. Photograph, graph, diagrams, radiographs, table. (K1, CN)

205-K. Aspects of Welding Research in British Merchant Shipbuilding. II. R. B. Shepheard. *Welding and Metal Fabrication,* v. 22, Feb. 1954, p. 69-76.

Development of weldable alloys for marine use and structural tests on welded and riveted ships. Photographs, diagrams. 28 ref. (K9)

206-K. (Dutch.) **Fifteen Years of Electrode Production.** G. Westendorp. *Smit Mededelingen,* v. 8, no. 4, Oct.-Dec. 1953, p. 138-140.

Reviews work carried out in connection with welding problems. Photograph, micrograph. (K1, T5)

207-K. (French.) **Preparation of Thin Layers on a Tantalum Support. Technique in Obtaining Highly Adhesive Thermal Deposits and Fixation of Tantalum to Copper by Brazing.** P. Garin, P. Léger and P. Prugne. *Journal de physique et le radium,* v. 15, no. 1, Jan. 1954, p. 45A-46A.

Method of applying tantalum foil to iron and copper used as target supports in Van de Graff experimentation. 12 ref. (K8, Cu, Fe, Ta)

208-K. (French.) **Distribution of Gases in Oxy-Acetylene Cutting and Welding.** *Métallurgie et la construction mécanique,* v. 85, no. 12, Dec. 1953, p. 981, 983-984.

Rational use and economy of gases in welding. Photographs, diagram. (K2, G22)

209-K. (German.) **Strength Tests of Bonded Light Metal Joints.** P. Brenner and A. Matting. *Aluminium,* v. 30, no. 1, Jan. 1954, p. 3-9.

Strength and stress distributions were studied for static and dynamic loads on monocoque structures. Graphs, photographs, tables. 6 ref. (K9, Al)

210-K. (Swedish.) **OK R3 and OK R6. New Basic Stainless Steel Electrodes.** T. Hellerström. *Svetsaren,* v. 18, no. 3, 1953, p. 36-39.

Welding properties of eight different austenitic, ferritic and ferritic-austenitic electrodes. Tables, photographs. (K1, T5, SS)

211-K. **Welding Operations in Hydro-Electric Plant.** A. N. G. Bray. *Australasian Engineer,* 1954, Jan. 1, p. 52-57.

Welding requirements for water turbine, hydraulic gate and penstock construction. Diagrams. (K general)

212-K. **The Development of Metal-Arc Welding and Electrodes During the Past Half-Century.** E. Flintham. *British Welding Journal,* v. 1, Jan. 1954, p. 3-10.

Early types of electrodes and arc welding processes. Reviews progress of metal-arc welding, with its successes and failures and post-war development. Diagrams, photographs, graph, table. 5 ref. (K1)

213-K. **The Welded Structure in a Pump-House Foundation.** Harold Smith. *British Welding Journal,* v. 1, Jan. 1954, p. 13-25.

Shop fabrication and site assembly of a mild steel structure which constitutes the shoe of a reinforced-concrete caisson. Component parts of the shoe are analyzed from structural as well as site-welding points of view. Diagrams, photographs. (K general, CN)

214-K. **Effect of Steel Quality on Spot-Welding Properties.** J. E. Roberts and H. E. Dixon. *British Welding Journal,* v. 1, Jan. 1954, p. 27-35.

Experiments to determine differences in spot weldability between five grades of 18 S.W.G. low-carbon steel, of deep or extra deep drawing quality. Tables, graphs, photographs. (K3, CN)

215-K. **The Use of Self-Adjusting Arc Equipment for Welding a Light-Alloy Deckhouse.** P. T. Houldcroft and H. E. Dixon. *British Welding Journal,* v. 1, Jan. 1954, p. 36-44.

First application of process in what is likely to be one of its more important fields. Practical details and recommendations. Report is of particular interest in that all welding was carried out in the open. Diagrams, photographs, photomacrographs, table. 5 ref. (K1, Al)

216-K. **Automatic Submerged Arc Saves 60% When Rebuilding Worn Equipment.** Ivan R. Bartter. *Industry & Welding,* v. 27, Mar. 1954, p. 37-40, 68, 70-71.

Process is faster and quality of welds produced is superior to hand welds. Photographs. (K1)

217-K. **"Slope Control" Lengthens Tip Life and Improves Weld Quality.** Chas. Bruno. *Industry & Welding,* v. 27, Mar. 1954, p. 44-46, 67.

Spot welding of aluminum with conventional single-phase alternating current type welders. Tables, oscillograms. (K3, Al)

218-K. **How to Weld Aluminum-Bronze to Steel.** Lowell H. Hawthorne. *Industry & Welding,* v. 27, Mar. 1954, p. 50-52, 54.

Copper alloys and steel are often welded together to secure economy, structural strength and corrosion resistance. Photograph, diagram. (K general, Al)

219-K. **How to Interpret Weld Radiographs.** *Industry & Welding,* v. 27, Mar. 1954, p. 58-62, 64-66.

Brief account of some factors which have to be considered in interpreting radiographs of welds made by various electric-arc processes in steels. Radiographs. (K1, S13, ST)

220-K. **"Faster Fusion".** William P. Brotherton. *Modern Industrial Press,* v. 16, Feb. 1954, p. 24, 28, 30, 58.

Fusion welding jigs and procedures. Welding by inert gas-shielded and submerged-arc methods. Photographs. (K1)

221-K. Metal to Non-Metal Brazing. *Metal Treatment and Drop Forging,* v. 21, Feb. 1954, p. 66.
Materials and techniques. (K11)

222-K. Arc Welding Flanged Shells. Donald F. Baumler. *Modern Machine Shop,* v. 26, Mar. 1954, p. 150-155.
Both automatic and semi-automatic submerged-arc equipment employed in making longitudinal and girth joints. Photographs, diagram. (K1, CN)

223-K. A Technique of Soldering to Thin Metal Films. Richard B. Belser. *Review of Scientific Instruments,* v. 25, Feb. 1954, p. 180-183.
Use of indium and certain of its alloys as a solder, without a flux. Adherence to thin metal films may be readily obtained without destruction of the film. Tables, micrographs. 6 ref. (K7, In)

224-K. The Welding of Nickel and High Nickel Alloys. Lester F. Spencer. *Sheet Metal Worker,* v. 45, Feb. 1954, p. 65-66, 68, 70.
Jigs and factors influencing selection of welding methods. Diagrams, tables, photograph. (To be continued.) (K general, Ni)

225-K. Modern Welding of Aircraft Components. W. P. Brotherton. *Steel Processing,* v. 40, Feb. 1954, p. 92-96, 115.
Five basic types of shielded-arc welding in general use. Photographs. (K1)

226-K. Effect of Polyphase Motors on the Voltage Regulation of Circuits Supplying Three-Phase Welder Loads. Max A. Faucett, Marvin Fisher, Jr., and M. Stanley Helm. *University of Illinois Bulletin (Engineering Experiment Station Bulletin Series no.* 418), v. 51, no. 19, Oct. 1953, 42 p.
Problem of light flicker caused by operation of an arc welder. Graphs, tables, diagrams oscillograms. (K1)

227-K. Outstanding Welding Repairs to the Base of a 5,000-Ton Press. J. K. Mortimer. *Welder,* v. 22, Oct.-Dec. 1953, p. 103-107.
Equipment and techniques employed. Diagrams, photographs. (K general, CI)

228-K. Spotlight on Arc Welding. VIII. Sterling Foundry Specialties Ltd., Bedford. *Welder,* v. 22, Oct.-Dec. 1953, p. 108-111.
Equipment, techniques and applications. Photographs. (K1)

229-K. Welding as an Aid to Repairs and Maintenance in a Gas Works. *Welder,* v. 22, Oct.-Dec. 1953, p. 112-114.
Applications of repair welding. Photographs. (K general)

230-K. High-Frequency Butt Welding of Pipes for Steam Coils. Clyde B. Clason. *Welding Engineer,* v. 39, Mar. 1954, p. 24-26.
Equipment and techniques employed. Photographs. (K6)

231-K. 77 Years of Resistance Welding. II. Preston M. Hall. *Welding Engineer,* v. 39, Mar. 1954, p. 36-37.
Reviews early developments in equipment and procedures. Photographs. (To be continued.) (K3)

232-K. Plain Tips on Plain Steels. Lester F. Spencer. *Welding Engineer,* v. 39, Mar. 1954, p. 38-42.
Equipment, techniques and problems of arc welding plain carbon steels. Photographs, tables, graph. 4 ref. (K1, CN)

233-K. Testing High-Strength Silver-Brazing Alloys. Karl M. Weigert. *Welding Engineer,* v. 39, Mar. 1954, p. 44-45.
Shear and tensile tests. Diagram, graphs. 8 ref. (K8, Q2, Q27, Ag)

234-K. Fabrication of a Zirconium-Lined Reaction Vessel. O. G. Paasche and A. J. Killin. *Welding Journal,* v. 33, Feb. 1954, p. 115-118.
Welding of zirconium is accomplished by inert-gas-shielded process with protection by inert gas on the underside of the weld. Photographs, diagrams, table. (K12, Zr)

235-K. Silver and Gold for Brazing Electronic Components. A. W. Swift and R. J. Metzler. *Welding Journal,* v. 33, Feb. 1954, p. 119-123.
Alloys used for brazing various components employed in electronic industry. Photographs, tables. 6 ref. (K8, Au, Ag)

236-K. Arc Characteristics for Consumable-Electrode Gas-Shielded Welding. R. W. Tuthill. *Welding Journal,* v. 33, Feb. 1954, p. 128-132.
Experimental investigation of inert-gas-shielded metal arc in order to establish volt-ampere curves for different metals. Graphs, diagram, table, photograph. (K1)

237-K. New Development in Fluxes for Automatic Welding and Hard Surfacing. L. K. Stringham. *Welding Journal,* v. 33, Feb. 1954, p. 132-136.
Advantages of mixing properly formulated finely ground particles of flux ingredients together with a proper binder and drying resultant agglomerate. Photographs. (K1, L24)

238-K. Study and Recommendation for the Welding and Brazing of Individual Diesel Locomotive Parts as Well as the Hardfacing of Wearing Parts. Otto Gier, chairman. Paper from "Official Proceedings of the 1953

Annual Meeting Master Boilermakers' Association", p. 101-113; disc., p. 120-124.
Includes photographs.
(K general, L24)

239-K. (French.) **Production of Large-Diameter Steel Tubes by Welding.** O. L. Bihet. *Ossaturae metallique,* v. 18, no. 12, Dec. 1953, p. 622-625; disc., p. 625-627.
Presented at International Congress of Information Centers on Steel at Brussels. Belgian production of water and gas mains having a diameter larger than 250 mm. Photographs. (K general, ST)

240-K. **Electrodes for the Welding of Acid-Resisting Cr-Ni-Mo-Ti Steels.** G. A. Ukolov. *Henry Brutcher, Altadena, Calif., Translation no.* 3188, 5 p. (From *Avtomaticheskaya Svarka,* v. 6, no. 3, 1953, p. 46-49.)
Favorable results obtained by addition of ferromanganese to coating of electrodes. Tables, photograph. 3 ref. (K1, AY, Cr, Ni, Mo)

241-K. (German.) **Resistance Welding.** A. Erker. *Schweissen und Schneiden,* v. 6, no. 1, Jan. 1954, p. 30-35.
Various methods of resistance welding. Diagrams, photographs, table. (K3)

242-K. (Spanish.) **Design of Welded Constructions.** F. Koenigsberger. *Ciencia y técnica de la Soldadura,* v. 3, no. 15, Nov.-Dec. 1953, 12 p.
Practical method of calculating characteristics and conditions. Diagrams, graphs. (K general)

243-K. (Spanish.) **Glass-Metal Union by Means of Plastic Adhesives Applied to the Production of Cathode-Ray Tubes.** R. Mearin. *Ciencia y técnica de la Soldadura,* v. 3, no. 15, Nov.-Dec. 1953, 4 p.
Experimental work on obtaining a glass-metal seal capable of supporting a vacuum of the order of 1 x 10^{-5} mm. mercury. Diagrams. (K11)

244-K. (Spanish.) **Influence of Hydrogen and Silicon on Electric Arc Welding.** J. L. Zuloaga. *Ciencia y técnica de la Soldadura,* v. 3, no. 15, Nov.-Dec. 1953, 8 p.
Methods of evaluating hydrogen in steels. Apparatus used at the Instituo de la Soldadura, Madrid. Diagrams. 17 ref. (K1, ST)

245-K. (Book.) **Welding Engineering.** Boniface E. Rossi. 786 p. 1954. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. $8.00.
Fundamental facts about welding for the beginner and reference source for designers. Covers the various welding processes, metallurgy of welding and weldability of various metals, design and fabrication considerations, testing and inspection of welds, and appendices covering engineering data, definitions, bibliography and problems.
(K general)

246-K. **Journal Boxes Welded Economically.** *Canadian Metals,* v. 17, Mar. 1954, p. 42, 44.
Journal boxes for railroad rolling stock produced economically by automatic welding of two steel halves. Photographs. (K1, CN)

247-K. **Welding by the Harman Process. A Staff-Industry Report.** *Canadian Metals,* v. 17, Mar. 1954, p. 48-49.
Equipment and techniques of repairing cast iron following fracture or cracking. Photographs. The Harman process is a mechanical weld or "metal stitching" process. (K13, CI)

248-K. **Application of Pressed Powder Technique for Production of Metal-to-Ceramic Seals.** Walter Knecht. *Ceramic Age,* v. 63, Feb. 1954, p. 12-13; disc., p. 13.
Past work and present advantages of method in electron tube manufacture. (K11)

249-K. **Hardness Prediction in Welding.** Roy B. McCauley, Jr. *Engineering Experiment Station News (Ohio State University),* v. 26, Feb. 1954, p. 41-44.
Hardness traverse can be predicted from chemical compositions, shape of work and heat imput of the weldment. Graphs, diagram. 7 ref. (K general, Q29)

250-K. **Microcracks in Weld Metal.** P. C. Van Der Willigen. *Journal of Scientific & Industrial Research,* v. 13, sec. A, Jan. 1954, p. 26-30.
"Flakes" caused by presence of hydrogen and effect of cooling rate and composition on embrittlement of weld metal. Micrograph, tables. 4 ref. (K general, Q23)

251-K. **Shielded - Arc Techniques Dominate Ryan Fusion Welding.** *Machinery,* v. 60, Mar. 1954, p. 180-185.
Evaluates three techniques for welding aluminum and magnesium alloy aircraft engine parts. Photographs. (K1, Al, Mg)

252-K. **New Welding Tools Rate a Chance to Show Their Stuff.** Quentin Ingerson. *SAE Journal,* v. 62, Mar. 1954, p. 59-60.
Based on secretary's report of Panel on Welding, Milwaukee Production Forum, Sept. 1953. Reviews sigma and submerged-arc welding and use of low-hydrogen electrodes. Photograph. (K1)

253-K. Resistance Welding of Coated Mild-Steel Sheet. A. J. Hipperson. *Sheet Metal Industries,* v. 31, no. 323, Mar. 1954, p. 211-218.
Various welding problems caused by presence of coatings in mild steel. Recommends ways to obtain best results. Diagrams, tables, graphs. 5 ref. (K3, ST)

254-K. For the Younger Craftsman —Welding. F. Koenigsberger. *Sheet Metal Industries,* v. 31, no. 323, Mar. 1954, p. 219-222.
Guide to examination requirements. Welding technology. Diagrams. (To be continued.) (K general)

255-K. The Welding of Nickel and High Nickel Alloys. Lester F. Spencer. *Sheet Metal Worker,* v. 45, Mar. 1954, p. 71-72, 93.
Metallic, automatic - submerged, carbon and inert-gas metallic-arc welding. Table, photograph. (To be continued.) (K1, Ni)

256-K. Distortion Can be Designed Out of Welded Structures. J. R. Stitt. *Steel,* v. 134, Mar. 8, 1954, p. 120-122.
Understanding what happens in heat affected zones is tipoff to effective procedures for ending warpage and upsetting. Heat can straighten distorted members. Diagrams, photographs. (K9)

257-K. Electrode Materials for Resistance Welding. W. J. Armstrong and H. D. Baer. *Welding and Metal Fabrication,* v. 22, Mar. 1954, p. 95-97.
Right choice and design of electrode materials will increase life of electrode and benefit quality of welds. Diagrams, tables. (K3, T5)

258-K. Effect of Surface Conditions on Porosity and Mechanical Properties of Weld Metal. K. Winterton. *Welding and Metal Fabrication,* v. 22, Mar. 1954, p. 101-104.
Effects of light machine oil, gascut edges, rust and scale on plate surface. Tables, photographs, diagram. 3 ref. (K general, Q general, CN)

259-K. New Developments in Sigma Welding of Carbon Steel. T. McElrath and R. T. Telford. *Welding Journal,* v. 33, Mar. 1954, p. 201-207.
Improved torch handling technique plus specially deoxidized wire promises elimination of porosity. Tables, graph, diagrams, radiographs. 3 ref. (K1, CN)

260-K. Maintenance Welding in the Petroleum Industry. Don H. Rasmussen. *Welding Journal,* v. 33, Mar. 1954, p. 213-222.
Review of welding principles including identification of base metal, calculation of effect of heat to be applied, design of joint to be repaired and selection of filler metal. Photographs, diagrams. (K general)

261-K. Tell-Tale Damage Reveals Significance of Welded Ship Construction. T. D. Beery and LaMotte Grover. *Welding Journal,* v. 33, Mar. 1954, p. 234-236.
Information from examination of damage resulting from collision of ships includes strength of materials used, effectivèness of tools and techniques employed and quality of skill and craftsmanship. Photographs. (K general, ST)

262-K. Balancing Ignitrons in Frequency Converter Three-Phase Spot Welder. G. C. Woodmancy. *Welding Journal,* v. 33, Mar. 1954, p. 236-238.
Method using cathode-ray oscilloscope permits checking balance of inverse parallel connected ignitrons and making necessary adjustments in less than an hour without welding or subsequent testing. Diagrams. (K3)

263-K. Fast Welding Done on Floors for Army Cargo Trailers. Herbert Chase. *Welding Journal,* v. 33, Mar. 1954, p. 242-244.
Initial assembly is by sequence of spot welds. Main seams on four sides of central sheet are automatically submerged-arc welded by four heads that move 72 in. per min. after work is clamped in special machine. Photographs. (K3, K1, CN)

264-K. Soldering of Aluminum. J. D. Dowd. *Welding Journal,* v. 33, Mar. 1954, p. 113S-120S.
Preparation of soldered joints in aluminum and its alloys and resistance to corrosion. Graphs, tables, photograph. 11 ref. (K7, R general, Al)

265-K. Effect of Atmospheric Contaminants on Arc Welds in Titanium. J. C. Barrett and I. R. Lane, Jr. *Welding Journal,* v. 33, Mar. 1954, p. 121S-128S.
Effect of oxygen, nitrogen, hydrogen and water vapor on physical properties of inert-gas-shielded tungsten-arc welds. Tables, graphs, photographs. (K1, Q general, Ti)

266-K. Effect of Reinforcement on Performance of Weldments. Carl E. Hartbower. *Welding Journal,* v. 33, Mar. 1954, p. 141S-146S.
Reinforcement has tendency to raise transition temperature of a weldment. Its removal in critical areas may sometimes be desirable. Photographs, graphs, micrograph. 3 ref. (K general, Q23, CN)

267-K. Fusion Welding of Commercially Pure Titanium. Francis H.

Stevenson. *Welding Journal,* v. 33, Mar. 1954, p. 147S-153S.

Techniques for producing acceptable welds by inert-gas-shielded tungsten-arc method. Photographs, tables, graph. (K1, Ti)

268-K. Cold Arc Welding of Gray Cast Iron Using a Granular Flux and Gray-Iron Electrodes. A. I. Zelenov. *Henry Brutcher, Altadena, Calif., Translation no.* 3154, 8 p. (From *Avtogennoe Delo,* v. 24, no. 4, 1953, p. 7-9.)

Welds, using either a.c. or d.c., are identical with base metal, easy to machine and free from hard spots. Micrographs, photographs, diagrams, graph, tables. (K1, CI)

269-K. (French.) **Importance of Design in Welding.** H. Gerbeaux. *Soudure et Techniques connexes,* v. 8, nos. 1-2, Jan.-Feb. 1954, p. 9-18.

Deformations and stresses due to shrinkage. Suggestions for welded static structure, choice of materials, orientation of welds and preheating and post heating. Drawings. (K general)

270-K. (French.) **Application of Welding to Fabrication of Interchangeable Structural Elements.** P. Lorin. *Soudure et Techniques connexes,* v. 8, nos. 1-2, Jan.-Feb. 1954, p. 19-22.

Techniques for welding metal bridge girders. Photographs. (K general)

271-K. (French.) **Reports of Committee Chairmen of the International Institute of Welding on Papers Presented at Copenhagen, Denmark, Annual Meeting, July 5-10, 1953.** *Soudure et Techniques connexes,* v. 8, nos. 1-2, Jan.-Feb. 1954, p. 25-34.

Includes gas and resistance welding; standardization; health and safety; brittle fracture; fatigue tests; and teaching of welding. (K2, K3, Q26, Q7, A7)

272-K. (Russian.) **Novel Method of Speeding Up Manual Arc Welding.** L. Gillemot. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 3-4, 1953, p. 277-292.

Principle of double rod welding. Tests show 40 to 50% economy in energy consumption. No special coating is required on welding rods. Diagrams, tables. (K1)

273-K. (Russian.) **Automatic Copper Welding Under Flux.** K. V. Bagrianskii. *Vestnik Mashinostroeniia,* v. 33, no. 11, Nov. 1953, p. 85-86.

Results show that welding with copper electrodes produces seams of good mechanical properties. Photograph, micrograph, tables. 5 ref. (K1, Q general, Cu)

274-K. Nitrogen-Arc Welding of Copper. Edwin Davis and C. A. Terry. *British Welding Journal,* v. 1, Feb. 1954, p. 53-64.

Factors influencing arc stability and tungsten transfer across arc. Reasons for greater power of nitrogen-shielded arc compared with argon-arc. Diagrams, tables, graphs, radiographs, micrographs. 19 ref. (K1, Cu)

275-K. Spot Welding of Low-Alloy High-Tensile Steels. P. Joumat. *British Welding Journal,* v. 1, Feb. 1954, p. 64-65.

Torsion shear test is simple and practical method of determining quality of heat-treated spotweld. Graphs, table, diagrams. 3 ref. (K3, Q1, AY)

276-K. Reports of I.I.W. Commission 13. H. de Leiris. **Commission 9.** H. G. Geerlings. **Commission 4.** L. Blosset. **Commission 6.** F. M. L. van Horenbeeck. *British Welding Journal,* v. 1, Feb. 1954, p. 66-69.

Specifications for fatigue tests on welds, weldability tests, documentation of welding literature and welding terminology. (K9, Q7, A10)

277-K. Self-Adjusting Welding Arcs. J. C. Needham and W. G. Hull. *British Welding Journal,* v. 1, Feb. 1954, p. 71-77.

Based on E.R.A. Report Z/T91. Control of arc length in self-adjusting arcs with respect to changes in electrode-feed rate, current setting and open-circuit voltage. Graphs. 9 ref. (K1)

278-K. Nitrogen-Arc Welding of Copper. K. Winterton. *British Welding Journal,* v. 1, Feb. 1954, p. 87-90.

Sound butt welds have been made in ½-in. arsenical deoxidized copper plate using nitrogen-arc welding. Photograph, table, micrographs. 4 ref. (K1, Cu)

279-K. Welding in South Africa. F. J. A. van Reenen. *British Welding Journal,* v. 1, Mar. 1954, p. 101-105.

Survey of development of welding and production of welding equipment in South Africa. Applications of welding in some major industries. Photographs. (K general)

280-K. Investigations on Pressure Welding. R. F. Tylecote. *British Welding Journal,* v. 1, Mar. 1954, p. 117-135.

Principles of pressure or solid-phase welding. Investigates connection between weldability of various metals at room temperature and physical properties of oxide film. Tables, diagrams, micrographs. 27 ref. (K5, K9, P general)

281-K. Resistance Spot Welding of 3/16 and ¼ In. Mild Steel. J. E. Roberts. *British Welding Journal,* v. 1, Mar. 1954, p. 136-140.

Techniques of process as reported in literature. Graphs, tables, photographs. 12 ref. (K3, CN)

282-K. Faster Fusion. II. Inert Gas-Shielded Metal Arc Welding and Submerged Arc Welding. J. R. Fullerton. *Finish,* v. 11, Apr. 1954, p. 55-56.

Method of operation at aircraft plant. Photographs. (K1)

283-K. How to Braze Beryllium. M. J. Zunick and J. E. Illingworth. *Materials & Methods,* v. 39, Mar. 1954, p. 95-97.

Techniques proven successful in overcoming oxidation and insuring sound joints. Diagrams, photographs, micrograph. 12 ref. (K8, Be)

284-K. An Apparatus for Protection Against Dangerous Voltages in Welding Equipment. F. H. de Jong and D. W. van Rheenen. *Philips Technical Review,* v. 15, Jan. 1954, p. 199-204.

Based on principle of a voltage divider, which lowers voltage between welding rod and grounded work while no welding is taking place, but cuts out automatically as soon as welding is started. Graph, diagrams, photographs, oscillograms. 2 ref. (K1)

285-K. Hidden Arc Speeds Sheet Section Welding. *Steel,* v. 134, Mar. 22, 1954, p. 112.

Machines lay down sound, uniform welds at speeds of 70 in. per min. Fast metal deposition minimizes sheet warpage on railroad car body sections. Photographs. (K1, AY)

286-K. Tin in Automobile Body Construction. Homer C. Pratt. Paper from "Symposium on Tin". ASTM Special Technical Publication no. 141. p. 52-55; disc., p. 56.

Solder and flux compositions and methods of application of tin solders. (K7, T21, Sn)

287-K. (English.) **Recent Developments in the Riveting of Aluminium.** A. W. Brace. *Metallurgia,* v. 49, no. 292, Feb. 1954, p. 71-75.

Alloys suitable for use as rivets and design of preformed and driven heads. Tables, diagrams, graph, photographs. 11 ref. (K13, Al)

288-K. Testing Steels for Weldability. R. G. Braithwaite. *British Welding Journal,* v. 1, Feb. 1954, p. 70.

Bend test to determine weldability of steel. Table, photographs. (K9, ST)

289-K. (French and German.) **The Argomat. A New High-Duty Device for Protective-Gas Welding With Consumable Electrode.** M. E. Witting. *Zeitschrift für Schweisstechnik,* v. 44, no. 3, Mar. 1954, p. 64-70.

Requirements and operation. Method well suited for welding aluminum, copper and stainless steel. Diagrams, photographs, table, graph. (K2, Al, Cu, SS)

290-K. How Stored-Energy Resistance Welding Joins Dissimilar Metals. Thomas A. Dickinson. *Industry & Welding,* v. 27, Apr. 1954, p. 40-42, 84-85.

Materials, equipment and operating characteristics. Photographs, table. (K3)

291-K. Automatic Welding Builds 28-Ft. Stainless Steel Bellows. *Industry & Welding,* v. 27, Apr. 1954, p. 44 + 5 pages.

Bellows made by forming raw metal and welding convolutions to each other and to the necessary pipe ends. Photographs. (K1, SS)

292-K. A Guide to Pipe Welding Layout. III. Dorsey B. Thomas. *Industry & Welding,* v. 27, Apr. 1954, p. 59-60, 62-63.

Outlines methods for five-piece 90° turn, three-piece 60° turn and division of a 90° tube turn. Diagrams. (K general)

293-K. Use Low Hydrogen Electrodes to Repair Alloy Steel Castings. F. R. Drahos. *Industry & Welding,* v. 27, Apr. 1954, p. 77-78, 81, 83.

Equipment, materials and techniques. Photographs, table. (K1, AY)

294-K. A Guide to Fabricating Magnesium by Manual Inert Arc Welding. *Industry & Welding,* v. 27, Apr. 1954, p. 86-87.

Data sheet. Diagrams. (K1, Mg)

295-K. Automatic Welder for Aluminum Pipelines. *Steel,* v. 134, Apr. 5, 1954, p. 114.

Equipment and operating techniques. Photographs. (K1, Al)

296-K. Nickel-Lined Ship for Liquid Chemicals. Herman C. Phelps. *Welding Engineer,* v. 39, Apr. 1954, p. 41-44.

Welding and construction procedures, inspection methods and performance expectations. Photographs, diagram. (K general, Ni)

297-K. Are You Getting the Most From Your Electrode Dollar? M. O. Monsler. *Welding Engineer,* v. 39, Apr. 1954, p. 46-48, 53.

Stub losses, overwelding, poor fit-up and welding out of flat position

may be responsible for inefficiency. Charts, tables, diagrams. (K1)

298-K. Practical Design for Welding. I. Rex Cleveland. *Welding Engineer,* v. 39, Apr. 1954, p. 50-53.

Materials, weld types and sizes and strength requirements of members for tension, compression and shear loadings. Diagrams. (K general)

299-K. Brazing in Action. *Welding Engineer,* v. 39, Apr. 1954, p. 56-57.

Historical developments, theory of mechanism, materials, equipment, techniques and factors influencing good brazing. Photographs. (K8)

300-K. Here's the Way Storts Welding Repairs Heavy Iron Castings. Harold S. Card. *Welding Engineer,* v. 39, Apr. 1954, p. 58-60, 66.

Equipment and techniques for producing weld structure that can hardly be distinguished from structure of parent metal. Photographs. (K general, CI)

301-K. 77 Years of Resistance Welding. III. Preston M. Hall. *Welding Engineer,* v. 39, Apr. 1954, p. 62-63.

Development of electronic control. Photographs. (K3)

302-K. Two Arcs and Helium Speed Job. *Welding Engineer,* v. 39, Apr. 1954, p. 64, 66.

Use of thoriated-tungsten electrodes contributed to faster production welding on boxes of aluminum for portable radios. Photographs. (K1, Al)

303-K. Self-Retaining Fasteners Give 30-50% Production and 30% Cost Savings. Cliff Mohr and Al Alcaraz. *Western Metals,* v. 12, Mar. 1954, p. 58-60.

Specifying self-retaining fasteners or Speed Nuts can result in reductions of materials and materials handling, elimination of welding, clinching or staking, savings in production time and improved worker efficiency. Photographs. (K13)

304-K. (Russian.) **Cold Welding of Cast Iron.** Ia. Ia. Sineok, M. S. Baranov, L. A. Pankul, L. S. Sapiro, I. Z. Kagan, P. A. Glukhov, V. I. Mikhin and A. S. Kirpichev. *Vestnik Mashinostroeniia,* v. 34, no. 2, Feb. 1954, p. 68-79.

Experiences of various authors on use of different electrodes. Advantages and disadvantages of process. Diagrams, micrographs, photographs, table. (K1, CI)

305-K. (Russian.) **Properties of Welded Joints Made With Basic and Neutral Electrode Coatings.** Antonin Benesk. *Vestnik Mashinostroeniia,* v. 34, no. 2, Feb. 1954, p. 80-81.

Basic coatings permit improved vertical and overhead welding. Table, graphs. (K1, CN)

306-K. (Book.) **Joining Magnesium.** 126 p. 1953. Dow Chemical Co., Midland, Mich.

Welding methods; adhesive bonding; mechanical joining; brazing; soldering; • protection of assemblies from corrosion. (K general, R general, Mg)

307-K. (Book.) **Simple Blueprint Reading With Special Reference to Welding.** 207 p. 1953. Lincoln Electric Co., 12818 Coit Rd., Cleveland 17, Ohio. $1.00, U.S.A. $1.50, elsewhere.

Published as a service to the welding industry for educational purposes. Welding symbols as standardized by the American Welding Society. (K general)

308-K. Fusion Welding Titanium. Francis H. Stevenson. *Aero Digest,* v. 68, Apr. 1954, p. 60, 62, 64.

Successful welding with tensile strength range from 70,000 to 100,000 psi. and a minimum 15% elongation in 2-in. gage length. Welds are made by inert-gas shielded tungsten-arc process with and without filler materials. Photographs, tables. (K1, Ti)

309-K. Welders Go Sky-High. J. G. Church. *Canadian Metals,* v. 17, Apr. 1954, p. 44, 46, 48.

Application of welding to construction of refinery equipment. Photographs. (K general)

310-K. Powdered Iron Enters Into Electrode Designs. *Canadian Metals,* v. 17, Apr. 1954, p. 50, 52-53.

Heavily coated electrodes containing large quantities of powdered metal in their coatings obtain increased welding speeds of the order of 50%, with appearance in smoothness and freedom from spatter almost equal to that obtained with automatic welding. Photographs, table. (K1)

311-K. Mechanism of Ceramic-to-Metal Adherence. Adherence of Molybdenum to Alumina Ceramics. A. G. Pincus. *Ceramic Age,* v. 63, Mar. 1954, p. 16-20, 30-32.

Experimental evidence points to need for controlled amount of oxide of metal available at metal-ceramic interface as an essential step in establishment of strong ceramic-to-metal bond. Micrographs, graph, diagram, table. 17 ref. (K11, Mo)

312-K. Annular Ceramic Tube. W. E. Coykendall. *Ceramic Age,* v. 63, Mar. 1954, p. 33-36; disc., p. 36.

Molybdenum-manganese joining process used to construct U.H.F.

power triode with 30 to 2000 Mc range and 200 to 700 watts output. Photographs. (K11, Mo, Mn)

313-K. High-Tensile Steel Bolts for Structural Joints. I-II. *Engineer,* v. 197, Mar. 19, 1954, p. 415-417; Mar. 26, 1954, p. 453-455.

Properties of bolts, nuts and washers. Representative fastening method and a number of applications to railway bridges and other structures. Drawings, photographs. 2 ref. (T13, AY)

314-K. Studies in Resistance Welding Yield Improvements in the Manufacture of Thin-Wall Steel Tubing. Donald P. Worden. *General Motors Engineering Journal,* v. 1, Mar.-Apr. 1954, p. 14-18.

Equipment, operating techniques and applications. Diagrams, graphs. (K3, F26, ST)

315-K. The Pressure Welding of Molybdenum. A. R. Moss. *Institute of Metals, Journal,* v. 82, Apr. 1954, p. 374-378 + 4 plates.

Construction and use of controlled-atmosphere pressure-weld chamber. Micrographs, graphs. (K2, Mo)

316-K. Braze-Welds Join Cast Iron Conduit. *Linde Tips,* v. 33, Apr. 1954, p. 29-31.

Oxy-acetylene flame processes used in producing underground piping. Photographs. (K2, CI)

317-K. Design Manual on Adhesives. *Machine Design,* v. 26, Apr. 1954, p. 144-174.

Types and choice of adhesives, bonding methods and joint design. Photographs, tables, graphs, diagrams. (K12)

318-K. G.E.C. Precision Spot Welding Machine With Electronic Control. *Machinery (London),* v. 84, Mar. 19, 1954, p. 614-615.

Increase in scope of resistance welding made possible by recent 4 kv-amp. electronically controlled spot welder which welds many nonferrous metals not previously considered suitable for joining by this method. Photographs. (K3, EG-a)

319-K. Welded Joints in Stainless Equipment. *Metal Progress,* v. 65, Mar. 1954, p. 79.

Sound metal, properly chosen, correctly joined and adequately heat treated, is essential to avoid expensive and quick failures. (K1, SS)

320-K. A Fully-Automatic Welding Process. J. Burrows. *Overseas Engineer,* v. 27, Apr. 1954, p. 328-330.

High-amperage submerged arc provides faster welding, uniform quality and elimination of spatter. Costs reduced and operator fatigue lessened. Photographs. (K1)

321-K. Ceramic-Metal Seals of the Tungsten-Iron Type. D. G. Burnside. *RCA Review,* v. 15, Mar. 1954, p. 46-61.

Ceramic to be metallized is brush or spray coated with thin layer of mixed tungsten and iron powders and fired to a suitable temperature in a diluted reducing atmosphere. Photograph, diagrams, tables, graphs. (K11, W, Fe)

322-K. Structural Adhesives for Metal Aircraft. N. A. de Bruyne. *Rubber and Plastics Age,* v. 35, Mar. 1954, p. 119-121.

Advantages and limitations over other methods of making aircraft structures. 9 ref. (To be continued.) (K12)

323-K. Manufacture of Electrodes for the Arc Welding of Aluminum and Aluminum Alloys. L. V. Biryukova. *Henry Brutcher, Altadena, Calif., Translation no.* 3153, 3 p. (From *Avtogennoe Delo,* v. 24, no. 6, 1953, p. 25-26.)

Preparation of suitable coatings, composition, grinding, equipment needed, coating application, drying, storage of finished electrodes and precautions to be taken. (K1, T5, Al)

324-K. (French.) **Gluing of Metals in Aviation Structures.** F. Vinsonneau and C. Thomas. *Docaéro,* 1954, no. 26, Mar., p. 15-24.

Reasons for use of cement in large structural parts. Equipment and use of Redux and Araldite Type-I cements. Photographs. (K12)

325-K. (French.) **The Determination of Hydrogen in Arc Welds in Mild Steel. Method of Presentation of Results.** Albert Roux. *Revue de métallurgie,* v. 51, no. 3, Mar. 1954, p. 192-200; disc., p. 200-202.

Tests for suitable technique of obtaining samples for determination of hydrogen content. Tables, graphs, photograph. 3 ref. (K1, CN)

326-K. (German.) **Electrical Resistance Welding of Aluminum.** A. Müller-Busse. *Schweissen und Schneiden,* v. 6, no. 3, Mar. 1954, p. 93-102.

Principles, design and selection of machine circuits and controls. Recommends acid treatment of preparing surface. Electrodes, welding data and strength properties of the weld. Photographs, diagrams, graphs. 17 ref. (K3, L12, Al)

327-K. (German.) **Advances in the Field of Welding and Cutting.** J. Ruge. *Schweissen und Schneiden,* v. 6, no. 3, Mar. 1954, p. 115-117.

Review of recent publications on electric-arc welding. 30 ref. (K1)

328-K. (German.) **Use and Structure of Basic-Lime Coated Electrodes.** G. Zoethout. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 2, Feb. 1954, p. 58-61.

More carbon and manganese were retained but less oxygen, nitrogen and hydrogen were introduced. Graphs, photograph. (K1)

329-K. (Russian.) **Low-Temperature Welding With Use of Induction Heating of Welded Parts.** A. I. Alekseev. *Vestnik Mashinostroeniia,* v. 33, no. 10, Oct. 1953, p. 79-80.

Process and results of experimental tests. Diagrams. (K6)

330-K. (Russian.) **High-Speed Automatic Gas Welding of Thin Walled Pipes.** I. A. Antonov. *Vestnik Mashinostroeniia,* v. 33, no. 10, Oct. 1953, p. 81-84.

Includes diagrams, graph, table, photograph, micrograph. (K2)

331-K. (Spanish.) **How to Weld Babbitt Metal.** *Fusion de Metales,* v. 16, no. 2, Mar.-Apr. 1954, p. 5-9.

Heating effects, preparation of pieces, puddle rod and welding process. Drawings. (K general, SG-c)

332-K. High Temperature Metal Ceramic Seals. Harry Bender. *Ceramic Age,* v. 63, Apr. 1954, p. 15 + 9 pages.

Telefunken process, hydride method and active metal technique. Tables, photographs, micrographs. 35 ref. (K11)

333-K. Shrink-Fit Investigations on Simple Rings and on Full-Scale Crankshaft Webs. A. S. T. Thomson, A. W. Scott and C. M. Moir. *Engineer,* v. 197, Apr. 9, 1954, p. 531-533.

Results of behavior of simple ring-and-plug arrangements and model two-pin web assemblies. Diagrams, graphs. (K13)

334-K. Seam Welding With Wire Electrode. *Engineering,* v. 177, Apr. 2, 1954, p. 445.

Thin metal sheets welded at speed of 2 ft. per min. with electronically-controlled seam welder. Photograph. (K3, ST, Ni, Cu)

335-K. Research and Development Work on Electric Welding. *Engineering,* v. 177, Apr. 9, 1954, p. 476-477.

New laboratory of Quasi-Arc Co., Ltd., designed to control raw materials and perform basic electrode research and development. Photographs. (K1)

336-K. Why Automatic Welding? Jack Jarms. *Industry & Welding,* v. 27, May 1954, p. 49-52, 82-83.

Labor and overhead costs reduced by versatile method. Photographs. (K1)

337-K. Fabricate High Tensile Steel With Inert Arc Welding Process. I. Morrison. *Industry & Welding,* v. 27, May 1954, p. 58-60, 63, 83.

Tests on fuel tank fabrication show good welds with desirable physical characteristics of arc welding, but without excessive penetration and with much less porosity. Photographs. (K1, AY)

338-K. Contact Electrodes. A Special *Industry & Welding* **Report.** *Industry & Welding,* v. 27, May 1954, p. 64 + 6 pages.

Study of contact-type welding electrodes. Electrodes with iron powder in their coatings are claimed to be a radical departure from standard electrode design. Graphs, photographs, chart, diagrams. (K1)

339-K. Speed Welding of Silicon Bronze With Semi-Automatic Inert-Arc Process. Donald Baumler. *Industry & Welding,* v. 27, May 1954, p. 118-120.

Method used in fabrication of 25-ton vapor condenser. Photographs, diagram. (K1, Cu)

340-K. Titanium Welding Procedures. *Light Metal Age,* v. 12, Apr. 1954, p. 15, 35.

Techniques of shielding weld and adjoining parent-metal sections from atmosphere while at temperatures above about 1400° F. (K general, Ti)

341-K. Tools for Koldwelding Wire and Sheet. W. A. Barnes. *Modern Metals,* v. 10, Apr. 1954, p. 57-59.

Tools for joining nonferrous metal parts without use of heat, electricity, acid flux or other chemicals. Drawings, photographs. (K5, EG-a)

342-K. Automatic Arc and Resistance Welding as Applied to Sheet and Strip Metal. J. A. Dorrat. *Sheet Metal Industries,* v. 31, no. 324, Apr. 1954, p. 301-308, 310.

Automatic welding as applied to metallic, atomic-hydrogen and argon-arc welding. Resistance welding considered. Diagrams, tables, photographs. (To be concluded.) (K1, K3)

343-K. The Welding of Nickel and High Nickel Alloys. Lester F. Spencer. *Sheet Metal Worker,* v. 45, Apr. 1954, p. 70-72, 88.

Excellent weld joints in high-nickel alloys obtained by oxy-acetylene welding procedure in practically all types of welding positions. Tables, photograph, diagrams. (To be continued.) (K2, Ni)

344-K. A Way to Use Titanium Scrap. *Steel,* v. 134, Apr. 26, 1954, p. 104.

Solid ingot of metal is formed by resistance spot welding a thick

stack of scrap sheets submerged in liquid. Coolant solves oxidation and heat problems. Photographs. (K3, A8, Ti)

345-K. Powdered Iron in Electrode Designs. L. K. Stringham. *Steel Processing,* v. 40, Apr. 1954, p. 224-225.

Heavily coated electrodes containing large quantities of powdered metal in their coatings permit increased welding speeds with appearance in smoothness and freedom from spatter almost equal to that obtained with automatic welding. Photographs, table. (K1)

346-K. Joining Thin Walled Parts by Deforming With Rubber. Frank R. Simpson. *Tool Engineer,* v. 32, May 1954, p. 71-74.

Abstracted from ASTE paper 22T2. Equipment, procedures, limitations and applications. Diagrams. (K11)

347-K. Cold Pressure Welding. W. A. Barnes. *Tool Engineer,* v. 32, May 1954, p. 75-78.

Abstracted from ASTE paper 22T37. Clean interfaces of relatively soft metals are kneaded and flowed together by tooling of special configurations. Photographs. (K5)

348-K. New Welding Laboratories at Bilston. *Welding and Metal Fabrication,* v. 22, Apr. 1954, p. 149-153.

Equipment and methods to provide facilities for quality control, research and development. Photographs. (K general)

349-K. In the Fabrication Shop. *Welding and Metal Fabrication,* v. 22, Apr. 1954, p. 156-157.

Practical aspects of welding and metalworking. Diagrams, photograph. (K general, G general, Al, Cu, Zn)

350-K. Multiple Electrode Welding by "Unionmelt" Process. D. E. Knight. *Welding Journal,* v. 33, Apr. 1954, p. 303-312.

Nomenclature and power supply in multiple-submerged arc welding. Advantages and applications of several types of connections. Diagrams, photographs. 1 ref. (K1)

351-K. Resistance Spot Welding of Titanium and Its Alloys. A. J. Rosenberg. *Welding Journal,* v. 33, Apr. 1954, p. 324-328.

Properties of spot welded joints in titanium and its alloys. Comparisons with spot welded joints in other materials. Tables, photographs, graphs. 1 ref. (K3, Ti)

352-K. Welding of 90/10 Copper-Nickel Alloy. G. R. Pease and T. E. Kihlgren. *Welding Journal,* v. 33, Apr. 1954, p. 329-338.

Data indicate iron-bearing 90-10 cupronickel can be satisfactorily welded by all currently important fusion-welding processes. Important variables defined. Suggested areas of usefulness for several methods. Tables, diagram, graphs, photographs, radiographs. 6 ref. (K general, Ni, Cu)

353-K. Twinarc Submerged Arc Welding. Theodore Ashton. *Welding Journal,* v. 33, Apr. 1954, p. 350-355.

Use of two small diameter electrodes in place of one larger electrode in a single submerged-arc welding head. Diagram, photographs. (K1)

354-K. D-C Welders—Rectifiers or Motor Generator Sets? S. Oestreicher. *Welding Journal,* v. 33, Apr. 1954, p. 356-360.

Compares static and dynamic performance characteristics. Photographs, diagram, graphs, table, oscillograms. (K1)

355-K. Carbon-Steel Electrodes for Use With Inert Gas Shields. Harry C. Cook and Gilbert R. Rothschild. *Welding Journal,* v. 33, Apr. 1954, p. 361-371.

Study of properties of weld deposits from an electrode for production use in welding of carbon steel by inert-gas-shielded metal-arc process. Use of fully killed steel electrode indicated. Tables, graphs, photographs. (K1, CN)

356-K. Low-Temperature Welding Alloys Speed and Simplify Structural Model Fabrication. Sidney Shore and Edward W. Rothfuss, Jr. *Welding Journal,* v. 33, Apr. 1954, p. 376-379.

Study of a model provides empirical data for designers of suspension bridge to determine adequacy of lateral bracing. Effect of torsional loading upon the stiffness and stress distribution in the truss. Photographs, diagram. (K general, Q25)

357-K. Army First Pass Groove Weld Crack Susceptibility Test. Z. J. Fabrykowski, S. Goodman and B. A. Schevo. *Welding Journal,* v. 33, Apr. 1954, p. 168S-172S.

Test is predicated on necessity of producing satisfactory crack-free first pass welds and bringing welding to scientific level. Diagrams, photographs, tables. (K9)

358-K. High Temperature Brazing Shows Big Future for Bonding Jet Age Metals. George D. Cremer, Frank J. Filippi and Richard S. Mueller. *Western Metals,* v. 12, Apr. 1954, p. 43-47.

Commercially available brazing alloys include copper, Coast metals,

silver-manganese, manganese-nickel, palladium-silver, palladium-nickel, Solabraze and Nicrobraz. Photographs, micrographs.
(K8, Cu, Ag, Mn, Ni, Pd)

359-K. Arc-Welding Electrodes and Their Manufacture. I. G. Fritz. *Wire and Wire Products,* v. 29, Apr. 1954, p. 410, 412, 451. (Translated from article in *Draht*, Sept. 1953.)

Brief history of coated electrode processes. Current practice in electrode manufacture in Germany.
(K1, T5)

360-K. Brazing Titanium to Titanium and to Mild and Stainless Steels. W. J. Lewis, G. E. Faulkner, P. J. Rieppel and C. B. Voldrich. Wright Air Development Center Materials Laboratory. WADC Technical Report 52-313, pt. 2, Dec. 1953, 50 p.

Joints were induction, torch and furnace brazed with commercial and experimental alloys. Induction brazed joints were strongest. Titanium-to-steel joints were difficult. Ductility was poor in titanium-titanium joints. (K8, Ti, CN, SS)

361-K. (French.) **Inspection of Welded Construtcions.** W. J. Kaufman. *Métallurgie et la construction mécanique*, v. 86, no. 3, Mar. 1954, p. 203 + 8 pages; disc., p. 215-217, 219, 221.

Analysis before production, supervising production and destructive and nondestructive testing. Tables, photographs, diagrams.
(K general, S general)

362-K. (French.) **Modern Welding Material.** Raoul Soulier. *Métallurgie et la construction mécanique*, v. 86, no. 3, Mar. 1954, p. 223-225, 227-229.

Recent developments in various methods of welding. Preparation, assembling and handling of boiler parts. Photographs, graph.
(K general)

363-K. (French.) **Application of Electrical Resistance Welding.** G. Moressée. *Métallurgie et la construction mécanique,* v. 86, no. 3, Mar. 1954, p. 231-232.

Assembling of frame parts by spot welding. Technical and economical advantages. Photographs.
(K3)

364-K. (French.) **Noncorrosive Brazing With a Soldering Iron.** *Revue de l'Aluminium*, v. 31, no. 208, Mar. 1954, p. 96-97.

Cadmium-zinc compound with melting point of 280° C. Easy to apply and useful for joining aluminum roofing. Photographs.
(K8, Cd, Zn, Al)

365-K. (French.) **Mechanical Riveting of Light Metals.** B. Adaridi. *Revue de l'Aluminium,* v. 31, no. 208, Mar. 1954, 123-129.

Development and operation of hydraulic and oleo-pneumatic riveting machines. Diagrams, graphs, photographs, tables. (To be continued.)
(K13, Al)

366-K. (German and French.) **Weldable Malleable Iron "GF".** Th. Walter. *Zeitschrift für Schweisstechnik,* v. 44, no. 4, Apr. 1954, p. 86-90.

Melted by a special process, this iron is characterized by low silicon and sulfur content. Carbon content of weld joints is reduced by a special heat treatment. (K general, CI)

367-K. (German.) **Press Welding Experiments With Armco Iron at Temperatures Between 400 and 800° C.** Helmut Held and Hans Hendus. *Zeitschrift für Metallkunde,* v. 45, no. 3, Mar. 1954, p. 112-116.

Dependence of joint strength on temperature in vacuum-welding process. Diagram, table, graphs. 12 ref. (K5, Fe)

368-K. (Russian.) **Production and Repair of Forge Dies by Electroweld Build-Up.** P. I. Tabachnikov and P. P. Gol'man. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 54-57.

Preparation, chemical composition and performance of electrodes. Diagrams, tables, micrographs. (K1)

369-K. (Russian.) **Automatic Arc Welding of Aluminum Alloys.** A. A. Alov and G. D. Nikiforov. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 60-63.

Apparatus and methods showing advantages of simplicity, high productivity, low cost and high-quality welds. Photographs. (K1, Al)

370-K. (Russian.) **Electro-Rivet Welding.** S. I. Sobolev and N. E. Petukhov. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 66-69.

Method is simpler, less expensive and more applicable than contact welding. Diagrams, photograph, table. (K6)

371-K. Subcommittee Report on New Specification for Bare Stainless Steel Welding Rods and Electrodes. *ASTM Bulletin,* 1954, no. 198, p. 77-80.

Applicable to filler metals for use in a wide variety of processes. Diagrams, tables. 1 ref. (K1, T5, SS)

372-K. Researches on Welded Pressure Vessels and Pipelines. Nicol Gross. *British Welding Journal,* v. 1, Apr. 1954, p. 149-160.

Strain measurements in pressure vessels, in connection with stress

peaks in drumheads and around large openings such as nozzles. Diagrams, tables, photographs, graphs. 29 ref. (K9, Q25, ST)

373-K. Some Oxidation Effects During the Pressure Welding of Steels. J. E. Hughes. *British Welding Journal,* v. 1, Apr. 1954, p. 161-166.

Inhomogeneities in structure of steel pressure welds result from internal oxidation of elements such as silicon and manganese. Products of reaction nucleate ferrite at the weld plane and lead to sharp discontinuities in carbon concentration. Table, micrographs. 8 ref. (K2, ST)

374-K. Hydrogen—Barrier to Welding Progress. C. L. M. Cottrell. *British Welding Journal,* v. 1, Apr. 1954, p. 167-176.

Sources of hydrogen and effect on mechanical properties of steels. Tables, graphs, photographs. 25 ref. (K general, Q general, ST)

375-K. Weldability of Mn-Mo Steel Related to Properties of the Heat-Affected Zone. C. L. M. Cottrell. *British Welding Journal,* v. 1, Apr. 1954, p. 177-186.

Mechanical properties of commercial manganese-molybdenum steel studied after simulating conditions which occur in heat-affected zone adjacent to metal-arc welds. Tables, diagrams, photographs, micrographs. 14 ref.
(K9, Q general, AY)

376-K. (Pamphlet.) **Recommended Practices for Repair Welding of Cast Iron Pipe Valves and Fittings.** 12 p. 1954. American Welding Society, 33 W. 39th St., New York 18, N. Y. $0.50.

Practical details of repair methods. Materials covered include gray iron, white cast iron, chilled cast iron, malleable iron, alloy cast iron, and nodular cast iron. Welding processes include arc welding with nickel, mild steel, cast iron, and copper-base electrodes; oxy-acetylene welding and braze welding; and carbon-arc welding. (K1, K2, CI)

377-K. (Book.) **Brazing and Soldering of Titanium and Its Alloys.** 117 p. U. S. Dept. of Commerce, Office of Technical Services, Washington 25, D. C. PB 111225. $3.00.

Results of recent experimental procedures, with special attention to means for developing maximum heat nearest to overlapping surfaces and protecting them from harmful oxidation. (K7, K8, Ti)

378-K. (Book.) **Metallurgy of Welding.** W. H. Bruckner. 290 p. 1954. Pitman Publishing Corp., 2 W. 45th St., New York 19, N. Y. $6.00.

Supplies background for specification of metals for welding, design of welding joints, and compounding of coatings for metallic electrodes. (K general)

379-K. (Book.) **Welding, Brazing and Metal Cutting.** E. Malloy, editor. George Newnes, Ltd., Tower House, Southhampton Street, London W.C. 2, England. 15s.

Introduction to these processes compiled by a number of individuals and companies. (K general, G22)

380-K. Silver Brazing Goes Semi-Automatic. C. P. Spiesz and F. G. Leuthner. *American Machinist,* v. 98, May 10, 1954, p. 121-124.

Setup brazes air-fan rotors and stators automatically once work is clamped. Photographs, graph.
(K8, Ag)

381-K. Weld Seam and Weld Flux Effect on Metal Surface and Coating Life. A. J. Liebman. *Corrosion,* v. 10, May 1954, p. 147-150.

Alkaline and hygroscopic welding flux by-products, deposited on weld seam and adjacent areas, frequently cause early failure of coatings on welds. Photographs. 1 ref. (K1)

382-K. Plastic Welding Fixtures Cost Little, Assure Accuracy. A. P. Challenger. *Iron Age,* v. 173, May 6, 1954, p. 124-125.

Fixtures made of cast phenolic resin offer a substantial cost advantage over metal fixtures. Photographs. (K general)

383-K. Welding Tubes to Tube Sheets. H. A. Huff, Jr., and A. N. Kugler. *Mechanical Engineering,* v. 76, May 1954, p. 421-425, 433.

Brazing process used on tubes of unfired heat transfer equipment. Diagrams, chart, photograph. 9 ref. (K8)

384-K. Design of a Metal-to-Plastic Joint That Resists Stress. W. E. Cummings. *Precision Metal Molding,* v. 12, May 1954, p. 38-39, 92-93.

Solution to problem of inserting a molded plastic piece between two metal end connectors so assembly will resist torque, internal pressure and tensile stress. Photographs. (K11)

385-K. Fastening Sheet-Metal Parts by Tongues, Snaps or Clinching. *Product Engineering,* v. 25, May 1954, p. 174-175.

Detachable and permanent assembly of parts. Diagrams. (K13)

386-K. Heavy Armoured Vehicle Fabrication. J. W. Brind. *Welding and Metal Fabrication,* v. 22, May 1954, p. 166-173.

Welding of tank armor plate and castings. Photographs, diagrams. (K general)

387-K. Atomic Hydrogen Welding in the Chain-Making Industry. A. T. P. Black. *Welding and Metal Fabrication,* v. 22, May 1954, p. 174-177.

Care to insure correct choice of filler wire, good welding technique and complete protection of weld metal in its fluid state from contamination—particularly from atmosphere. Micrographs, photographs. 2 ref. (K1, ST)

388-K. Automatic Welding and Rapid Erection of Spherical Pressure Vessels in Russia. A. S. Fal'kevich and M. B. Gann. *Welding and Metal Fabrication,* v. 22, May 1954, p. 178-181. (Translated from *Avtogennoe Delo, Moscow,* v. 23, no. 3, 1952.)

Previously abstracted from original. See item 492-K, 1952. (K1, ST)

389-K. Protection From Radiation of Personnel Engaged in Inert-Gas Metal-Arc Welding. *Welding and Metal Fabrication,* v. 22, May 1954, p. 183.

General precautions with special reference to welding of aluminum alloys. (K1, Al)

390-K. New Way to Repair Ductile Iron. *Welding Engineer,* v. 39, May 1954, p. 49.

Technique of filling up blowholes and shrinkage cavities in ductile iron castings with sound metal. Micrographs. (K general, CI)

391-K. Practical Design for Welding. II. Rex Cleveland. *Welding Engineer,* v. 39, May 1954, p. 58-60.

Elimination of guesswork from design computations by use of formulas. Diagrams. (K9)

392-K. Powdered Iron in the Coating? The Case For. L. K. Stringham. *Welding Engineer,* v. 39, May 1954, p. 65, 68.

Advantages of greater speed, lower cleaning costs and smoother welds. Photographs, table. (K1, ST)

393-K. Development of Welded Bridge Construction. Nathan W. Morgan. *Welding Journal,* v. 32, Oct. 1953, p. 923-927.

Reviews research, specifications and resulting practice. Photographs, diagrams. (K general, T26)

394-K. Continuous Welded Structures. W. S. Atkins and E. M. Lewis. *Welding Journal,* v. 32, Oct. 1953, p. 928-946.

Surveys welded structures in Great Britain and Europe. Diagrams, photographs.
(K general, T26)

395-K. Joining of Ductile Iron by Several Arc Welding Methods. T. E. Kihlgren and H. C. Waugh. *Welding Journal,* v. 32, Oct. 1953, p. 947-956.

Metal and inert-arc welding of magnesium-containing cast iron, using nickel-iron or steel electrodes and nickel-iron filler wire. Tables, photographs. (K1, CI)

396-K. Fusion Welding of Light-Gage Alloys. J. T. Maloney. *Welding Journal,* v. 32, Oct. 1953, p. 966-969.

Suitable jigs and proper welding processes assure successful welding of aircraft assemblies. Photographs. (K1, K2, Al)

397-K. Some Considerations on Weldability of Aluminum Alloys. J. Koziarski. *Welding Journal,* v. 32, Oct. 1953, p. 970-986.

Reviews international literature. Diagrams, graphs, micrographs, tables, photographs. 57 ref. (K9, Al)

398-K. Quarry Maintenance. J. Dean Davidson. *Welding Journal,* v. 32, Oct. 1953, p. 992-996.

Heavy heating with oxy-acetylene flame, oxy-acetylene welding and oxygen cutting processes. Photographs. (K2, G22)

399-K. The Effect of Alloying Elements on Welds in Titanium. G. E. Faulkner, G. B. Grable and C. B. Voldrich. *Welding Journal,* v. 32, Oct. 1953, p. 481S-497S.

Effects of iron, manganese, chromium and molybdenum on mechanical and metallurgical properties of welded joints in titanium. Tables, diagrams, photographs, graphs, micrographs. 2 ref.
(K general, Q general, Ti)

400-K. Investigation of Structural Failures of Welded Ships. I. Examination of Samples and Analyses of the Failures. Morgan L. Williams and George A. Ellinger. *Welding Journal,* v. 32, Oct. 1953, p. 498S-527S.

Samples of fractured plates from 100 ships examined. Tests on 130 selected plates analyzed. Photographs, tables, micrographs, graphs. 25 ref. (K9, CN)

401-K. (German.) **Electric Resistance Welding of Light Alloys.** G. Moressée. *Aluminium,* v. 30, no. 4, Apr. 1954, p. 152-157.

Classification of welds, importance of parameters. Graphs, diagrams. (K3, Al)

402-K. (German.) **Rationalization in the Production of Bicycles and Light-Weight Motorcycles by Resistance Welding.** H. Kleine-Weischede. *Schweissen und Schneiden,* v. 6, no. 4, Apr. 1954, p. 142-145.

Increased economy in industrial application. Photographs, diagrams. (K3)

403-K. (Swedish.) **Electrode OK70P.** *Svetsaren,* v. 18, no. 4, 1953, p. 49-52.

Analysis, physical properties and use of electrode. Mechanical properties, heat treatment and microstructure of welds. Tables, graph, micrographs. (K1, T5, AY)

404-K. (Swedish.) **Method of Repairing Broken Engine Blocks and Similar Work Pieces.** Arthur Nilsson. *Svetsaren,* v. 18, no. 4, 1953, p. 53-54.

Repaired by welding. Photographs. (K general, CI)

405-K. The 'Great Jib' of the W1400 Walking Dragline. A. Scott. *British Welding Journal,* v. 1, May 1954, p. 197-205.

Welded structure of world's largest walking dragline. Table, photographs, diagram. (K general, AY)

406-K. Tentative Code of International Symbols for Designating Covered Electrodes for Arc Welding of Mild and Low-Alloy High-Tensile Steels. *British Welding Journal,* v. 1, May 1954, p. 205-208.

Guide which may be adopted by all countries, describes electrodes by means of symbols. Tables, diagrams. (K1, S22, CN, AY)

407-K. Resistance Welding of Coated Steels. A Review of Information. J. E. Roberts. *British Welding Journal,* v. 1, May 1954, p. 233-237.

Review of information on cadmium, lead, tin, zinc, aluminum and copper coated steels. Tables, graphs. 17 ref. (K3, ST)

408-K. Effect of Degaussing on Electric Arc Welding Operations in Ships. *Bureau of Ships Journal,* v. 3, May 1954, p. 43.

Bureau fo Ships recommends no welding be performed aboard a ship when its degaussing circuits are energized. (K1)

409-K. Modern Welding Technique. IV. Miscellanea. Sec. 24. The Training of Welders. E. T. Gill and Eric N. Simons. *Edgar Allen News,* v. 33, May 1954, p. 109-110.

Theory of welding, practical application and uses of material. (To be continued.) (K general)

410-K. Organic Bonding Metals. A. L. Phillips. *Modern Metals,* v. 10, May 1954, p. 57-58.

New bonding compound requires simple equipment, operates in lower heat ranges, produces bond strengths to 5000 psi.; also used as a filler in defective metal parts. Photographs. (K12)

411-K. Automatic Arc and Resistance Welding as Applied to Sheet and Strip Metal. J. A. Dorrat. *Sheet Metal Industries,* v. 31, no. 325, May 1954, p. 391-403.

Application of welding processes to automation. Photographs, tables, diagrams, graph. 11 ref. (K1, K3)

412-K. The Welding of Mg Base Alloys. Lester F. Spencer. *Sheet Metal Worker,* v. 45, May 1954, p. 90-91, 98-99.

Fusion and gas welding; cleaning procedures. Photographs, table. 1 ref. (K1, K2, Mg)

413-K. Welding High-Temperature Materials. Francis H. Stevenson. *Tool Engineer,* v. 32, June 1954, p. 73-76.

Fusion and resistance welding. Gives choices for particular temperature range. Photographs, graph, table. 2 ref. (K1, K3, SS, Ti)

414-K. Recommended Clearances for Copper Brazing. *Tool Engineer,* v. 32, June 1954, p. 85-86.

Results of brazes in a hydrogen atmosphere using unalloyed copper paste and wire with brazing temperature of 2050° F. Table. (K8, Cu)

415-K. Automatic Welding of Light-Gauge Fabrications. Rowland Gardener. *Welding and Metal Fabrication,* v. 22, May 1954, p. 184-187, 193.

Plate preparation and correct jigging achieve good results. Photographs, diagrams. (K1)

416-K. Tolerance and Control on Fillet Welds. John Mikulak and Merle Dillman. *Welding Journal,* v. 33, May 1954, p. 449-458.

Welding procedure control to insure suitable joint characteristics in use of manually operated semi-automatic submerged-arc process. Photographs, graphs, diagrams. (K1)

417-K. Austenitic Manganese Steel Welding Electrodes. Howard S. Avery and Henry J. Chapin. *Welding Journal,* v. 33, May 1954, p. 459-479; disc., p. 479.

Properties and welding techniques for use of molybdenum-manganese electrodes in repair and hard facing of manganese steel parts and for miscellaneous hard-facing applications. Micrographs, graphs, tables, diagrams, photograph. 18 ref. (K1, L24, Mo, Mn, AY)

418-K. Working Conditions Ambient to Inert-Gas-Shielded Metal-Arc Welding. Leslie Silverman and Harry Gilbert. *Welding Journal,* v. 33, May 1954, p. 218S-229S.

Gas and fume concentrations and control of operator exposure. Spectrogram, tables, photographs. 26 ref. (K1)

419-K. (French.) **Fatigue Behavior of Aviation Landing Gear. Experimental Comparison Between Joining by**

Rivets and Gluing. D. Clerc and M. Bogaievsky. *Recherche Aéronautique,* 1954, no. 38, Mar.-Apr., p. 57-62.
Gluing may show greater mechanical strength. Tables, diagrams, graphs. 10 ref. (K13, K12, Q7, Al)

420-K. (French.) **Machine Riveting of Light Metals. II.** B. Adaridi. *Revue de l'Aluminium,* v. 31, no. 209, Apr. 1954, p. 167-171.
Design of hydraulic-pneumatic machine with coupled generator and receiver. Diagrams, photographs. (K13, Al)

421-K. (German.) **Welding of Gray Iron.** L. Queck. *Giesserei,* v. 41, no. 9, Apr. 29, 1954, p. 242-243.
Procedures for electric and gas welding. Diagrams, table, graph. (K1, K2, CI)

422-K. (German.) **New Processes for Welding Various Metals.** *Umschau in Wissenschaft und Technik,* v. 54, no. 9, May 1, 1954, p. 275.
Welding of metal pieces not exceeding 1 sq. cm. by means of a condensor impulse discharge. Experiments on tungsten with constantan, German silver, copper, lead, aluminum and bismuth, aluminum with copper, cermet with steel and lead with steel. Photographs. (K6, W, Ag, Cu, Pb, Al, Bi, ST)

423-K. The Oxy-Acetylene Flame for Welding and Cutting. J. P. (Mike) Weed. *Industry & Welding,* v. 27, June 1954, p. 56-57, 59-60.
Advantages, processes and equipment. Photographs. (K2, G22)

424-K. "Slag-Gas" Shielded Arc Welding Speeds Fabrication of Mild Steel. *Industry & Welding,* v. 27, June 1954, p. 64 + 6 pages.
New, faster more efficient method than conventional arc welding with flux-covered electrodes. Photographs, diagram. (K1, CN)

425-K. How to Resistance Weld Low-Alloy High-Tensile Steels. C. F. Altenburger. *Industry & Welding,* v. 27, June 1954, p. 101-104.
Tips on spot, seam and flash welding. Tables, photographs, graph. (K3, AY)

426-K. Automatic Percussion Welding Speeds Contact Assembly. A. L. Quinlan. *Machinery,* v. 60, June 1954, p. 168-171.
Multiple welding of contact blocks to ends of small wires in forming stationary contact member of the Bell System's new wire spring relay. Photographs, diagrams, micrograph. (K3)

427-K. How to Solder Stainless Steel. *Steel,* v. 134, May 31, 1954, p. 108.
Materials, equipment and methods. Photographs. (K7, SS)

428-K. How to Weld Stainless Steel. *Steel,* v. 134, May 31, 1954, p. 109-110.
Materials, methods and equipment. Photographs, table. (K general, SS)

429-K. 30 Tons of Aluminum Wire, 15 Tons of Copper Wire. W. F. Pentz. *Welding Engineer,* v. 39, June 1954, p. 40-44.
Tonnage of welding wire required to Mig weld 6000 tons of aluminum bus and 2,750 tons of copper bus at new Kaiser plant. Photographs, diagrams, table. (K1, Al, Cu)

430-K. NEMA Standard for Electrode Identification. *Welding Engineer,* v. 39, June 1954, p. 59.
Latest electrode color chart. Diagrams, chart. (K1, S22)

431-K. (French.) **Arc-Welding of Self-Hardening Steels.** H. Granjon. *Revue de métallurgie,* v. 51, no. 4, Apr. 1954, p. 221-231; disc., p. 231-232.
Effect of electrodes, melting characteristics and welding conditions on cracking defects. Photographs, micrographs, tables, graphs, diagrams. 2 ref. (K1, ST)

432-K. (German.) **Hard Facing by Submerged-Arc Welding.** Karl Gering. *Schweissen und Schneiden,* v. 6, no. 5, May 1954, p. 183-192.
Repair and hardfacing of sintering drums and supporting rollers of high alloy steel. Process and economy. Graphs, photographs, diagrams, table. (K1, L24, AY)

433-K. (German.) **Electric Power Supply in Spot and Seam Welding.** S. Spizig. *Schweissen und Schneiden,* v. 6, no. 5, May 1954, p. 192-196.
Disadvantages of single-phase system. Welding with reduced frequency and three-phase connections. Graphs, diagrams. 7 ref. (K3)

434-K. (Pamphlet.) **Resistance Welding of Miscellaneous and Dissimilar Metals.** 1954. Resistance Welder Manufacturers' Association, 505 Arch St., Philadelphia. $0.10.
Bulletin No. 19 on spot, seam and flash welding of titanium; cobalt-base alloys; refractory metals; zinc and zinc die castings; lead and lead alloys; and dissimilar metals. (K3, EG-d, Ti, Co, Zn, Pb)

435-K. (Book.) **Metals and How to Weld Them.** T. B. Jefferson and Gorham Woods. 322 p. 1954. The James F. Lincoln Arc Welding Foundation, 12818 Coit Rd., Cleveland 17, Ohio. $2.00.
Mechanical and physical properties of metals, metallurgical significance in heat treating and welding, welding procedures and trouble shooting. (K general)

436-K. (Book—Russian.) **The Electric Arc Welding of Carbon and Alloy Structural Steels.** A. S. Ogievetski. 384 p. 1948. Government Scientific-Technical Publishing House, Moscow.

Detailed discussion on electrode coatings and welding processes. (K1, ST)

437-K. Sequence Control on Multispot Welders. John Sant. *Applied Hydraulics,* v. 7, June 1954, p. 63-64.

Automatic timing of work positioning and locking and actuation of 134 weld guns accomplished with electrically controlled pneumatic and hydraulic circuits. Diagram, photographs. (K3)

438-K. Welding in Canada. R. M. Gooderham. *British Welding Journal,* v. 1, June 1954, p. 245-252.

Developments and improvements in welding processes and techniques, and advancements in education, training and testing of operators. Photographs, diagrams. (K general)

439-K. Some Simple Statistical Methods for Resistance-Welding Investigations. H. E. Dixon and J. E. Roberts. *British Welding Journal,* v. 1, June 1954, p. 276-286.

Use of statistical concepts such as standard deviation, coefficient of variation and confidence limits for evaluating consistency and interpretation of results. Graphs, tables. 17 ref. (K3, S12)

440-K. Spot Welding Machines. Carr Harris. *Canadian National Research Council, Technical Information Service Report no.* 38, Mar. 1954, 14 p.

Bibliography of selected literature. Installation and equipment problems applicable to small shops. 28 ref. (K3)

441-K. Inert Gas Gives Titanium Tubing Protective Weld Backing. J. M. Thompson, Jr. *Iron Age,* v. 173, May 27, 1954, p. 118-119.

Thin-walled titanium tubular assemblies welded successfully, using inert gas inside of intricately shaped sections to prevent atmospheric contamination. Photographs. (K1, Ti)

442-K. Recent Progress in Joining Titanium. I. Welding Titanium. James H. Johnston. **II. Brazing of Titanium.** N. A. DeCecco and John M. Parks. *Materials & Methods,* v. 39, June 1954, p. 107-111.

Problems caused by air contamination and changes in thermal conditions occurring near the joint. Photographs. (K general, Ti)

443-K. Joint Strength Properties of Tin-Lead Alloy Deposits. Vincent P. McConnell. *Plating,* v. 41, June 1954, p. 636-640, 645.

Mass soldering in an automatic process has many advantages. Joint strength of deposits on steel and copper-plated aluminum. Graphs, photographs, table. 8 ref. (K7, Q23, ST, Pb, Sn, Cu, Al)

444-K. You Can Repair-Weld Cast Iron. *Power,* v. 98, June 1954, p. 119-121.

Review of methods, materials and equipment. Photographs, tables. (K general, CI)

445-K. Factors in Welding and Brazing Heat Exchanger Tubes. *Power Engineering,* v. 58, June 1954, p. 94-95.

Joint design and electrode or filler metal selection. Diagrams, table. (K1, K8, SG-h)

446-K. Selection of Soft Solders and Fluxes. H. C. Sohl. *Product Engineering,* v. 25, June 1954, p. 161-167.

Designer should know how solder alloys, fluxes and base metals affect characteristics of a soft solder joint. Photograph, graph, tables, diagrams. 4 ref. (K7, Sn, Pb)

447-K. Inert-Gas Shielded Welding Proves Cost Saver on Steel Tanks. W. L. Wyman. *Steel,* v. 134, June 7, 1954, p. 106-107.

Material costs are higher but lower unit labor costs more than make up the difference. Photographs, diagram, table. (K1, ST)

448-K. Evaluation of Alloys for Vacuum Brazing of Sintered Wrought Molybdenum for Elevated Temperature Applications. Kenneth C. Dike. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3148, May 1954, 13 p.

Twenty-five binary and ternary alloys with liquidus temperatures in the range 2000 to 2500° F. were prepared and evaluated. Tables, diagrams, micrographs. 4 ref. (K8)

449-K. Effect of Power Supply Characteristics on Sigma Welding. W. H. Helmbrecht and R. L. Hackman. *Welding Journal,* v. 33, June 1954, p. 531-536.

Development of a satisfactory supply to provide optimum arc performance and simple control. Oscillograms, graphs. (K1)

450-K. Inert-Gas-Shielded Titanium Brazing. Harlan L. Meredith. *Welding Journal,* v. 33, June 1954, p. 537-542.

Processes, procedures, metallurgical aspects and physical strength data in brazing and soldering titanium to itself and to other metals. Diagram, tables, photographs, micrographs. (K8, Q23, Ti)

451-K. New Results in Tool and Die Welding. Robert Groman. *Weld-*

ing Journal, v. 33, June 1954, p. 543-548.

Repair of sharp cutting edges of high-speed tools and chips or cracks in dies and punches. Photographs. (K general, TS)

452-K. High-Speed Motion Picture Photography Applied to Resistance Welding. I. S. Goodman. *Welding Journal,* v. 33, June 1954, p. 548-552.

Pictures of some resistance welding applications to small welds suggest how equipment may be further applied. Graphs, diagrams, photographs. 3 ref. (K3)

453-K. Process Adjustment in Inert-Gas-Shielded Arc Welding. Eugene B. LaVelle. *Welding Journal,* v. 33, June 1954, p. 553-560.

Factors involved in successful fabrication of weldments and their statistical control. Drawings. (K1, S12)

454-K. Current Rectification and High Frequency Interference in Inert Gas Welding. J. G. Murray. *Welding Journal,* v. 33, June 1954, p. 561-563.

Method for preventing undesirable current rectification and high-frequency interference. Diagrams. (K1)

455-K. Research of Welding Arc. M. Ozawa and T. Morita. *Welding Journal,* v. 33, June 1954, p. 280S-284S.

Report on characteristics of welding including self-regulation, material, current, voltage and electrode fall. Graphs, diagrams. 5 ref. (K1)

456-K. Penetration Factors in Metallic Arc Welding. Roger C. Waugh and Otto P. Eberlein. *Welding Journal,* v. 33, June 1954, p. 285S-288S.

Factors controlling penetration of various electrodes and reasons for differences. Diagrams, tables, graph, photograph. 8 ref. (K1, ST)

457-K. The Fatigue Factor in Welded Design. A. Erker. *Welding Journal,* v. 33, June 1954, p. 295S-304S. (Condensed from *Schweissen und Schneiden,* v. 5, 1953, p. 400-417.)

Previously abstracted from original. See item 132-K, 1954. (K general, Q25)

458-K. (Dutch.) **Hard-Soldering of Electronic Apparatus.** E. C. Smits. *Bedrijf en Techniek,* v. 9, no. 202; *Electronica section,* v. 7, no. 149, May 22, 1954, p. 81-83.

Special demands of soldering methods and materials in manufacture of vacuum tubes. Properties and adaptability of various solders. Tables, graphs. (K7)

459-K. (French.) **Welded and Cast Constructions in Large Electric Machines.** Max Andres. *Métallurgie et la construction mécanique,* v. 86, no. 5, May 1954, p. 401 + 4 pages.

Comparative study. Diagrams, photographs. (K general, E general)

460-K. (French.) **Arc-Welding of Self-Hardening Steels. Use of Austenitic Electrodes.** H. Granjon. *Soudure et Techniques connexes,* v. 8, nos. 3-4, Mar.-Apr. 1954, p. 89-99; disc., p. 99-100.

Welding difficulties, crack formation, selection and study of electrodes, characteristics and conditions for using electrodes. Tables, graphs, micrographs, photographs, diagrams. 2 ref. (K1, AY)

461-K. (Russian.) **Spot Welding of 30KhGSA Steel by Two-Impulse Cycle.** D. S. Balkovets, B. D. Orlov and P. L. Chuloshnikov. *Vestnik Mashinostroeniia,* v. 34, no. 4, Apr. 1954, p. 68-71.

Quality and appearance of weld and operation data. Tables, diagrams, micrograph. 4 ref. (K3, ST)

462-K. Butt-Welded Joints in Pipe Ranges. *British Engine, Boiler & Electrical Insurance Co. Ltd., Technical Report, New ser.,* v. I, Nov. 1952, p. 81-89.

Analysis of failures in welds. Incomplete root penetration was most common defect. Photographs, micrographs. (K general)

463-K. 30 Miles of Structural Welding Yields 15 Percent Steel Saving. Carl L. Kreidler. *Industry & Welding,* v. 27, July 1954, p. 33-35.

Combination of shop and field welding of large, prefabricated sections of factory building. Photographs, diagram. (K general, T26, CN)

464-K. Here's How Low-Alloy High-Tensile Steels Are Arc Welded. C. F. Altenburger. *Industry & Welding,* v. 27, July 1954, p. 40-42.

Electrodes and procedures for arc, submerged arc and gas shield-arc methods. Photographs, table. (K1, AY)

465-K. Ultrasonics Improve Soldered Joints in Aluminum. J. J. Obrzut. *Iron Age,* v. 173, June 24, 1954, p. 97-99.

Ultrasonic equipment powerful enough to effectively shatter oxide films helps to produce strong soldered joints in aluminum without using flux. Photographs, table, micrographs. (K7, Al)

466-K. Titanium Fusion Welded on Production Basis. L. Barrett and H.

D. Justis. *Iron Age,* v. 173, June 24, 1954, p. 106-109.

Inert gas-shielded welding. Argon, providing a stabler arc, is used to shield the molten weld puddle while helium is used for backup and for welding in a chamber. Photographs, tables. (K1, Ti)

467-K. Weldability. Assessment by Rapid Dilatation Tests. C. L. M. Cottrell. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 315-317.

Determination of relationship between the temperature at which the austenite-martensite transformation takes place in certain alloy steels and the liability of those steels to this form of cracking. Graphs, tables. (K9, AY)

468-K. How About Welding the Aluminum Alloys? I. Procedures for Spot Welding. Lester F. Spencer. *Welding Engineer,* v. 39, June 1954, p. 51-55.

Resistance welding alloys by spot, seam and flash welding methods. Equipment, preweld cleaning, machine settings and heat problems. Photograph, tables, graphs. 7 ref. (To be continued.) (K3, Al)

469-K. Your Welding Guide. *Welding Engineer (Directory Issue),* v. 39, June 1954, p. 5-40.

Brief data sheets on equipment and procedures for arc, gas and resistance welding. Includes sections on metal properties, grinding of welds and shop practice. Tables, nomograms, charts. (K1, K2, K3)

470-K. Product Classification List. *Welding Engineer (Directory Issue),* v. 39, June 1954, p. 41-124.

Classifications of welding equipment and supplies and kindred items. Names and locations of manufacturers. Table.
(K general, A10)

471-K. Trade Name Index. *Welding Engineer (Directory Issue),* v. 39, June 1954, p. 125-149.

Trade names employed by manufacturers of welding equipment and supplies. Names of manufacturers and the product or products to which the trade names refer. Table.
(K general, A10)

472-K. Names and Addresses. *Welding Engineer (Directory Issue),* v. 39, June 1954, p. 149-158.

Tabulated data for manufacturers of welding equipment and supplies.
(K general, A10)

473-K. Uniwelding at Menasco. Gilbert C. Close. *Western Machinery and Steel World,* v. 45, June 1954, p. 82-86.

Equipment and procedure for hot pressure welding of aircraft components. Photographs. (K2)

474-K. Reactions in Arc Atmosphere During Submerged Automatic Welding. V. V. Podgaetskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3072, 15 p. (From *Avtomaticheskaya Svarka,* v. 6, no. 1, 1953, p. 10-18.)

Relationship between weld porosity and reactions in which hydrogen forms compounds insoluble in liquid steel and stable at the high-arc temperatures. Tables. 27 ref. (K1, ST)

475-K. Ways of Minimizing Porosity of Weld Metal in Submerged Automatic Welding on Construction Sites. A. S. Fal'kevich and V. S. Volodin. *Henry Brutcher, Altadena, Calif., Translation no.* 3075, 8 p. (From *Avtogennoe Delo,* v. 22, no. 3, 1951, p. 21-23.)

Previously abstracted from original. See item 115-K, 1952.
(K1, CN)

476-K. Welding With a Consumable Electrode in an Atmosphere of Protective Gases. K. V. Lyubavskii and N. M. Novoshilov. *Henry Brutcher, Altadena, Calif., Translation no.* 3140, 9 p. (From *Avtogennoe Delo,* v. 24, no. 1, 1953, p. 4-8.)

Arc welding of various steels in a shielding medium of inexpensive active (instead of inert) gases. Photographs, radiographs, table. 3 ref. (K1, ST)

477-K. On the Problem of the Most Favorable Calcium Carbonate Content of Electrode Coatings. V. A. Lapidus. *Henry Brutcher, Altadena, Calif., Translation no.* 3225, 8 p. (From *Avtogennoe Delo,* v. 23, no. 11, 1952, p. 10-13.)

Study of ability of calcium carbonate to prevent oxidation of the deposited metal and loss of alloying elements by generating a shielding medium. Graph, photograph, tables. (K1)

478-K. Tests of Bonded and Riveted Sheet-Stringer Panels. Leonard Mordfin and I. E. Wilks. *U. S. National Advisory Committee for Aeronautics, Technical Note,* 3215, June 1954, 45 p.

Axial flat-end compression tests made on panels of 75S-T6 aluminum alloy. Graphs, photographs, diagrams, tables. 7 ref.
(K13, Q28, Al)

479-K. The Weldability of Ductile Iron. O. G. Paasche and W. H. Rice. Paper presented at Pacific Northwest Metals and Minerals Conference of the A.I.M.E., 1954, Portland, Ore. 13 p.

Includes tables, charts. (K9, CI)

480-K. (French.) **Practice of Autogenous Argon-Arc Welding.** H. Walser. *Aluminium Suisse,* v. 4, no. 3, May 1954, p. 80-90.

Procedure, electrodes and apparatus. Diagrams, graphs, photographs. (K1)

481-K. (French.) **Electric Resistance Welding, Assembly Process of High Productivity: Its Use in Construction of Aircraft Frames.** G. Moressée. *Technique et science aéronautiques,* 1954, no. 1, p. 11-27.

Technological and economic advantages, assembly techniques, corrosion protection. Photographs, tables, diagrams. (K3, R general, T24)

482-K. (German.) **Arc Welding of Light Metals in Rare Gas Atmosphere.** L. Wolff and W. Mantel. *Aluminium,* v. 30, no. 6, June 1954, p. 233-239.

Rectifying action exerted by the arc during a.c. welding with gas shielding. Weldability of various aluminum and magnesium alloys. Diagrams, tables, photographs, graph. 4 ref. (K1, K9, Al, Mg)

483-K. (German.) **Electric Resistance Welding of Light Alloys.** G. Moressée. *Aluminium,* v. 30, no. 5, May 1954, p. 200-207; no. 6, June 1954, p. 251-257.

Mechanical and electrical systems. Various welding procedures, machine control, applications and advantages. Photographs, tables, diagrams, graph. (To be continued.) (K3, Al)

484-K. (German.) **Cracking of Welds in Aluminum-Based Materials.** A. Müller-Busse. *Aluminium,* v. 30, no. 6, June 1954, p. 240-250.

Crack-tendency of binary, ternary and more complex aluminum-rich alloys. Graphs, micrographs. 21 ref. (K9, Q26, Al)

485-K. (German.) **Is the Use of High Efficiency Electrodes Economical?** Herbert Neumann. *Schweissen und Schneiden,* v. 6, no. 6, June 1954, p. 209-219.

Recent developments, melting time and rate, practical hints and calculations. Tables, graphs, diagrams, photographs. (K1)

486-K. (German.) **Oxy-Acetylene Welding in the Manufacture of Steam Vessels and Piping.** W. Müller. *Schweissen und Schneiden,* v. 6, no. 6, June 1954, p. 220-234.

Preparation, defects, multilayer welds, materials and detailed welding schemes. Photographs, diagrams, tables. (K2)

487-K. (German.) **Increase of Economical Efficiency by Use of Multi-Operator Welding Rectifiers.** Rod. Hofmann and O. Becken. *Schweissen und Schneiden,* v. 6, no. 6, June 1954, p. 234-237.

Mobility of multi-operator device, overload, 2500 amp. device, stationary device for 10,000 amp. and high voltage feeding. Table, photographs, diagram. 1 ref. (K1)

488-K. (German.) **Shrinking by Liquid Oxygen Cooling in Heavy Machine Construction.** Otto Peters. *Schweissen und Schneiden,* v. 6, no. 6, June 1954, p. 240-248.

Operation, materials and economy. Tables, diagrams, photographs, micrographs. (K13)

489-K. (German.) **Resistance Butt Welding of Steel Sheets by Foil Butt Seam Welders.** Ferdinand Busse. *Schweissen und Schneiden,* v. 6. no. 6, June 1954, p. 248-253.

Fundamentals, problems, experimental data. Photographs, diagrams, table. (K3, ST)

490-K. (German.) **Progress in Field of Welding and Cutting.** *Schweissen und Schneiden,* v. 6, no. 6, June 1954, p. 258-260.

Literature review of generalities on brazing, soft soldering or brazing, hard brazing, machines and equipment, fluxes and solders. 133 ref. (K8, K7, G22)

491-K. **Fused Vacuum-Tight, Metal-to-Ceramic, Ceramic-to-Glass, Metal-to Glass, and Metal-to-Mica Sealing by Powdered Glass Techniques.** N. Anton. *Ceramic Age,* v. 63, sec. I, June 1954, p. 15-16, 18-19; disc., p. 19.

Apparatus and procedure for sealing vacuum tubes. Graphs, photographs. (K11)

492-K. **Thread Inserts of 18-8 Stainless for Magnesium Components.** (Digest of "Performance Data: Stainless Steel Wire Screw Thread Inserts in Magnesium Applications", by Paul E. Wolfe, presented at ninth annual meeting of the Magnesium Association, New York, Nov. 2, 1953.) *Metal Progress,* v. 66, July 1954, p. 184 + 4 pages.

Improved methods for securely fastening components. Installation procedures and advantages. (K13, SS, Mg)

493-K. **Metal to Metal Bonding With Epoxy Resin-Based Adhesives.** D. W. Elam. *Product Engineering,* v. 25, July 1954, p. 166-169.

Bond characteristics, strength under static and impact loading and application factors for adhesives that simplify the assembly of sheet metal structures. Photographs, graphs, tables. (K12)

494-K. Unorthodox Methods of Casting Repair. W. H. Lane. *Welding Engineer,* v. 39, July 1954, p. 22-24.

Abstract of paper at 1954 annual meeting of the International Acetylene Association, Chicago, 1954. Use of "dished-out" treatment rather than a deep "V" to prepare edges of castings. Brazing of cast iron without preheating. Photographs. (K8, CI)

495-K. Pressure Welding—How It's Done, Where You Can Use It. *Welding Engineer,* v. 39, July 1954, p. 26-27, 35.

Theory, surface preparation and applications of press welding and roll welding. Dies used. Photographs. (K5)

496-K. Tested and Found Wanting. Wayne Jacobs and Charles Marschall. *Welding Engineer,* v. 39, July 1954, p. 32-35.

Comparison of quality of weld metal deposited by direct current against that deposited by alternating current. Graphs, diagram. (K1, CN)

497-K. Here's the Dope on Slag-Gas-Shielded Arc Welding. Felix Tancula. *Welding Engineer,* v. 39, July 1954, p. 38-39.

Equipment and operating procedures. Photographs. (K1)

498-K. (French.) **Transition Temperature of Brittleness; Quality Criterion of Arc Welding Electrodes.** Daniel Séférian and Marcel Moneyron. *Comptes rendus,* v. 238, no. 23, June 9, 1954, p. 2239-2242.

Classification of coated electrodes. Influence of heat treatments and transition temperature of two welds. Graphs. 2 ref. (K1, Q23, CN)

499-K. (German.) **New Applications of Oxy-Acetylene Welding Techniques.** Valentin Trunschitz. *Schweisstechnik,* v. 8, no. 4, Apr. 1954, p. 37-43.

Flame cutting, rust removal, surface hardening and stress-relief. Photographs. (K2, J2, G22)

500-K. (German.) **Nonfusion Welding of Aluminum and Aluminum Alloys.** G. M. Blanc. *Schweisstechnik,* v. 8, no. 4, Apr. 1954, p. 44-45.

Advantages over standard methods. Photographs. (K6, Al)

501-K. (German.) **Properties and Welding of Ductile Cast Iron.** Heinrich Edel. *Schweisstechnik,* v. 8, no. 4, Apr. 1954, p. 45-46.

Principle, application, advantages and mechanical properties. (K general, Q general, CI)

502-K. (Norwegian.) **Determination of Number and Size of Drops in Electric Arc Welding.** *Teknisk Ukeblad,* v. 101, no. 22, June 3, 1954, p. 507-508.

High-speed photographic study. Diagrams, table. (K1)

503-K. (Russian.) **Features of Formation and Cooling of a Spot Weld When Round Rods Are Cross Connected.** S. A. Adasinskii. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 12, Dec., p. 1856-1862.

Effects of quenching action of adjacent metal. Experiments with 10-mm., low-carbon rods. Graphs, photographs, micrographs. 2 ref. (K3, CN)

504-K. (Russian.) **Strength of Welded Joints.** A. A. Gafanovich. *Sel'khozmashina,* 1954, no. 6, June, p. 21-26.

Chemical composition and strengths of lap and butt welds made by manual and semi-automatic methods. Photographs, diagrams, graphs, tables. (K1, Q23, CN)

505-K. (Russian.) **Fluxes for Semi-Automatic Welding.** K. V. Liubavskii and M. M. Timofeev. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 45-48.

Results of development of two fluxes for low-carbon steel. (K1, CN)

506-K. (Russian.) **Method of Semi-Automatic Welding of Stainless Steel in Assembled Structures.** N. Iu. Pal'chuk and A. I. Akulov. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 48-50.

Results of inclined and vertical welding with solid flux. Tables, photographs, diagram. (K1, SS)

507-K. (Russian.) **Testing Welded Joints by Means of Ring-Shaped Test Pieces.** T. A. Vladimirskii. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 50-51.

Economy and ease of handling. Tables, photographs. (K9)

508-K. (Russian.) **Control of Hot Cracks During Welding.** S. A. Kurkin. *Vestnik Mashinostroeniia,* v. 34, no. 1, Jan. 1954, p. 79-82.

Results of work on automatic welding of low-carbon steel. Graphs, diagrams. 2 ref. (K1, CN)

509-K. (Russian.) **Electric Arc Welding of Bronze.** L. V. Golub. *Vestnik Mashinostroeniia,* v. 34, no. 1, Jan. 1954, p. 85-86.

Electrodes and their coatings. (K1, Cu)

510-K. (Book.) **Solder. Its Fundamentals and Usage.** Clifford L. Barber. 78 p. 1954. Kester Solder Company, 4201 Wrightwood Ave., Chicago 39, Ill.

Solders, fluxes, and flux-core wire solder. Soldering methods. (K7, Sn, Pb)

511-K. A Production Application of Structural Adhesive Bonding. G. E. Holback and S. C. Burridge. *Aircraft Engineering,* v. 26, July 1954, p. 224-228.

Use of adhesives to join metal skins to low-density cores, and to replace rivets and bolts. Fabrication procedures. Photographs, graphs. (K12)

512-K. Weldability of a B-Mo Steel Related to Properties of the Heat-Affected Zone. C. L. M. Cottrell. *British Welding Journal,* v. 1, July 1954, p. 315-321.

Transformation characteristics and the mechanical properties of commercial low-carbon boron-molybdenum steel. Tables, graphs, micrographs. 11 ref.
(K9, Q general, N8, AY)

513-K. Cooling Rates in Typical Arc-Welded Joints. C. L. M. Cottrell and B. J. Bradstreet. *British Welding Journal,* v. 1, July 1954, p. 322-326.

Thermal severity curves relate weld size to cooling rate at 300° C in the heat-affected zone. Tables, graphs, photographs, diagrams. 2 ref. (K1)

514-K. Welding Tool Steels. B. H. Chambers. *Edgar Allen News,* v. 33, July 1954, p. 145-147.

Factors affecting economy and strength of deposit for flash-butt welding of tool steels. Micrographs, photographs. (K3, TS)

515-K. Modern Developments in the Design and Manufacture of Welded Pressure Vessels. M. B. Hamilton and J. McIntyre. *Institution of Engineers & Shipbuilders in Scotland, Transactions,* v. 97, pt. 7, 1953-1954, p. 525-548.

Inspection of materials, welding, fabrication of large vessels at site, and inspection of finished structures. Photograph. (K general, T26)

516-K. Design of Brazed Joints. ASM Committee on Brazed Joints. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 115-122.

Types of joints and their properties. Filler metals; brazing processes. Diagrams, tables, graphs. 17 ref. (K8)

517-K. Soldering. Some Considerations of the Process and Its Mechanism. Phillip N. Fisk. *Sheet Metal Industries,* v. 31, no. 327, July 1954, p. 567-569.

Methods of removing oxide layers; analysis of subsequent surface reactions. Diagrams. (K7)

518-K. Iron Powder Coatings. Electrode Design Matches Advance Billing. Jerry Hinkel. *Steel,* v. 135, July 19, 1954, p. 104-105.

Operating characteristics of rutile iron powder electrodes. (K1, T5, ST)

519-K. Adhesives Join the Assembly Line. Thomas F. Hruby. *Steel,* v. 135, July 26, 1954, p. 88-91.

Advantages of adhesive joining. Typical applications. Photographs, table. (K12)

520-K. Stitching With Steel. Ron T. Smith. *Steelways,* v. 10, Aug. 1954, p. 14-15.

Nontechnical review of stitching equipment and uses. Photographs. (K13)

521-K. Less Corrosive Soldering Fluxes. *Tin and Its Uses,* 1954, no. 30, p. 9.

Hydrozinc compounds as substitutes for zinc chloride and natural resin. (K7)

522-K. Solderability of Nickel-Flashed Brass. *Tin and Its Uses,* 1954, no. 30, p. 10.

Thin flash-coating of nickel applied to brass before tinning effects an enormous improvement in solderability. (K7, Cu)

523-K. Special Problems in Structural Welding for Bridges. Stewart Mitchell and Arthur L. Elliott. *Welding Journal,* v. 33, July 1954, p. 633-642.

Importance of bridge structures made of suitable steels, properly designed, and fabricated with reasonable care. Photographs, table, diagrams. 9 ref. (K general, T26, ST)

524-K. Adhesive Bonding Complements Soldering and Brazing. H. H. Simons. *Welding Journal,* v. 33, July 1954, p. 647-650.

Basic materials used in adhesives; characteristics, and comparison with other joining methods. Tables. (K12)

525-K. Automatic Horizontal and Vertical Welding of Field Erected Structures. Amel R. Meyer. *Welding Journal,* v. 33, July 1954, p. 651-659.

Newly developed flux-supporting devices permit automatic submerged-arc welding of horizontal and vertical joints. Diagrams, photographs, micrographs, tables. (K1, ST)

526-K. Packaging Welding Generators. A. F. Fino. *Welding Journal,* v. 33, July 1954, p. 660-662.

Solving electrical power problems for field-welded structures by consolidating individual power requirements into one heavy-duty diesel engine. Photographs. (K1)

527-K. Consumable Insert Method of Root Pass Welding. Theodore A.

Risch and Alfred E. Dohna. *Welding Journal,* v. 33, July 1954, p. 670-679.

Butt welding plates or pipes with the inert-gas-shielded tungsten arc without the use of backing rings or bars. Diagrams, photographs, micrograph, table. (K1)

528-K. Effect of Electrode Type in the Notch Slow-Bend Test. William J. Murphy and R. D. Stout. *Welding Journal,* v. 33, July 1954, p. 305S-310S.

Using the Kinzel test, no increase in notch toughness is obtained with overmatching electrodes in welding plain carbon and high tensile steels as compared with E6010 electrodes. Tables, graphs. 5 ref. (K1, Q5, AY, CN)

529-K. Study of the Cooling Rates in Flash Welds in Steel. E. F. Nippes, Warren F. Savage, Gordon Grotke and S. M. Robelotto. *Welding Journal,* v. 33, July 1954, p. 339S-362S.

Functions of clamping distance, material thickness, and rate of platen acceleration using parabolic flashing patterns. Tables, graphs, micrographs. 5 ref. (K3, ST)

530-K. The Significance of the Tension Test for Spot Welds. E. R. Funk. *Welding Journal,* v. 33, July 1954, p. 363S-365S.

Improved test for evaluating spot weld quality. Diagrams. (K3, K9)

531-K. (Dutch.) **Apparatus for Measuring Current and Stresses During Argon-Arc Welding.** K. K. Zwart and P. DeJong. *Smit Mededelingen,* v. 9, no. 2, Apr.-June 1954, p. 50-53.

Control of factors necessary for comparable and reproducible test results. Diagrams, graph. (K1)

532-K. (French.) **Utilization of Oxy-Acetylene Flame in Various Welding Processes.** H. Granjon and M. Evrard. *Soudure et Techniques connexes,* v. 8, nos. 5-6, May-June 1954, p. 145-159.

Heat treatment of steel welds; recrystallization of metals below the transformation point; degassing of arc welds; and welding of aluminum. Tables, micrographs, photographs, diagrams. (K2, K1, J2, ST, Al)

533-K. (French.) **The Amount of Hydrogen in Arc Welds on Soft Steels. Method of Expressing Results Which Permits Characterizing the Electrodes.** A. Roux. *Soudure et Techniques connexes,* v. 8, nos. 5-6, May-June 1954, p. 160-168; disc., p. 168-169.

Test conditions and results. Tables, graphs, photograph. 3 ref. (K1, ST)

534-K. (German.) **Composition and Form of Nonmetallic Inclusions in Electric Arc Welding.** Kurt Born. *Stahl und Eisen,* v. 74, no. 13, June 17, 1954, p. 822-831; disc., p. 831.

Effects of type, amount, and distribution of inclusions. Diagrams, photographs, tables, graphs, micrographs. 17 ref. (K1, ST)

535-K. (Russian.) **Automatic Welding of Thick-Walled High-Pressure Boiler Drums.** I. N. Gerasimenko. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 76-78.

Operating conditions. Tables, photographs, diagram. 5 ref. (K1)

536-K. (Russian.) **Causes of Honeycomb Formation in Butt Welds of Small-Diameter Pipes.** V. M. Kondrat'ev and G. L. Petrov. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 78-83.

Causes of various welding defects and their elimination. Micrographs, tables, graph, diagrams. (K general, CN)

537-K. (Russian.) **Electric Arc Welding of Chromium-Nickel Alloy Sheets.** F. S. Bugrii. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 83-84.

Effect of metal thickness, seam dimensions, electrode diameter, and current strength. Micrographs, tables, diagrams. (K1, Ni, Cr)

538-K. (Russian.) **Welding of Thin Sheet Steel.** V. N. Mikhin. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 85-87.

Difficulties of working with thin sheets; electrode types and sizes; and types of joints. Diagrams, photograph, table. (K1, ST)

539-K. (Russian.) **Electric Furnace Melting of Flux for Automatic Welding.** M. M. Timofeev. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 88-90.

Physico-chemical process during melting of high manganese fluxes. Effect of fusion temperature and melting time on change of chemical composition. Tables, graphs. 5 ref. (K1)

540-K. (Spanish.) **Design for Welded Construction.** F. Koenigsberger. *Ciencia y técnica de la Soldadura,* v. 4, no. 16, Jan.-Feb. 1954, 12 p.

Practical methods. Graphs, table, diagrams. (K general)

541-K. Core Wire for the Production of Extruded Metal-Arc Welding Electrodes. W. I. Pumphrey. *Australasian Engineer,* May 1954, p. 48-49.

Suitability of wire for use as core wire in electrode production determined by chemical composition, surface quality and dimensional reliability. (K1)

542-K. Some Fundamental Problems in Percussive Welding. Eric Eden Sumner. *Bell System Technical Journal,* v. 33, July 1954, p. 885-895.

Effect of voltage variation and arc duration. Analysis of bridging. Improved methods and equipment. Diagrams, photographs, graphs. (K3)

543-K. Automatic Contact Welding in Wire Spring Relay Manufacture. A. L. Quinlan. *Bell System Technical Journal,* v. 33, July 1954, p. 897-923.

Projection-type resistance and percussion welding of precious metal contacts to wire relay springs. Photographs, diagrams, graphs. (K3)

544-K. Modern Welding Technique. IV. Miscellanea. Sec. 25. Safety in Welding. E. T. Gill and Eric N. Simons. *Edgar Allen News,* v. 33, July 1954, p. 161.

(To be concluded.) (K general, A7)

545-K. Helium-Nitrogen Shielding Gas Improves Welding of Low-Carbon Steel. Eugene L. Turner and Walter F. Heller. *General Motors Engineering Journal,* v. 1, July-Aug. 1954, p. 9-11.

Nitrogen mixed with helium promises significant cost reduction and improved weld quality. Comparison tests of various gases and mixtures. Tables, radiographs, photographs. 3 ref. (K2, CN)

546-K. Nitrogen Prevents Contamination of Inert Arc Welds in Stainless Piping. E. B. LaVelle. *Industry & Welding,* v. 27, Aug. 1954, p. 35 + 5 pages.

Advantages of nitrogen as a purging gas from standpoint of safety, corrosion rate and quality of weld. Micrographs. (K1, SS)

547-K. "Cool" Welding Eliminates Cracking in Silicon-Monel. Bela Ronay. *Industry & Welding,* v. 27, Aug. 1954, p. 40-41.

Advantages of and procedure for controlled repair welding of silicon-monel propellers. Photographs. (K6, Ni)

548-K. Make Intricate Structures From Brazed Aluminum Castings. J. H. Dunn and E. P. White. *Industry & Welding,* v. 27, Aug. 1954, p. 44 + 5 pages.

New techniques and advantages of brazing cast assemblies, including cylinder heads, crank cases and valve seats. Photographs, diagrams. (K8, Al)

549-K. Two-Sided Machines Step up Resistance Welding Production. George Murphy. *Industry & Welding,* v. 27, Aug. 1954, p. 52-54.

Automatic spot welder reduces number of operations, cuts time and costs, provides additional floor space and increases operator safety. Photographs. (K3)

550-K. Adhesive Bonding Magnesium Assemblies. D. A. Tooley. *Modern Metals,* v. 10, July 1954, p. 40, 42-43.

Application of organic bonding compounds. Photographs, graph. (K12, Mg)

551-K. The Welding of Monel and K-Monel. F. A. Ball. *Sheet Metal Industries,* v. 31, no. 327, July 1954, p. 562-566, 571.

Techniques of metallic, carbon, argon-arc, atomic hydrogen and oxy-acetylene welding. Table, diagrams, photographs, micrographs. (To be concluded.) (K1, K2, Ni)

552-K. Fast Roll-Spot Technique Doubles Welding Speeds. Bill Brotherton. *Steel Processing,* v. 40, July 1954, p. 439-440.

New technique with modified facilities has stepped up production. Photographs. (K3)

553-K. How About Welding the Aluminum Alloys? II. Procedures for Seam and Flash Welding. Lester F. Spencer. *Welding Engineer,* v. 39, July 1954, p. 42-44.

Resistance welding the aluminum-base alloys, equipment, preweld cleaning, machine settings and heat problems. Photographs, table. 7 ref. (K3, Al)

554-K. Alloy Welds Deposited in "Unalloyed" Titanium Base Metal. I. C. E. Hartbower and Daniel M. Daley, Jr. *Welding Journal,* v. 33, July 1954, p. 311S-326S.

Method for improving toughness and strength of weld joints. Diagrams, tables, photographs, micrographs. 5 ref. (K general, Ti)

555-K. (French.) **Study on Furnace Brazing of Aluminum and Light Alloys.** Roger Biais. *Métaux, Corrosion-Industries,* v. 29, no. 345, May 1954, p. 190-201.

Definitions, principles and specific problems. Diagrams, photograph, micrographs, graphs. 9 ref. (K8, Al)

556-K. (Russian.) **Preparing Pipes for Welding.** E. K. Korchinskii. *Energetik,* v. 2, no. 4, Apr. 1954, p. 17.

Device for cutting and beveling boiler pipes preparatory to welding. Diagrams. (K general)

557-K. It's Here! A Welded Steel Home. Clyde B. Clason. *Welding Engineer,* v. 39, Aug. 1954, p. 17-20.

Lightweight steel sections used in producing a newer, more desirable home with lower construction costs. Photographs. (K general, T26, ST)

558-K. Powdered Iron in the Coating? L. F. Megow. *Welding Engineer,* v. 39, Aug. 1954, p. 21.

Standard E-6013 electrode preferred over powdered coating electrode from cost standpoint. Photographs, table. (K1, T5, Fe)

559-K. "Shotwelding" Santa Fe Cars. Herman C. Phelps. *Welding Engineer,* v. 39, Aug. 1954, p. 28-31.

Resistance welding methods used to build stainless steel passenger cars for railroads. Photographs. (K3, SS)

560-K. Piping and Petroleum Plus Welding and Flame-Cutting. Jay Bland. *Welding Engineer,* v. 39, Aug. 1954, p. 32-35.

Oxy-acetylene flame solves many maintenance and repair problems for oil refineries. Photographs. 1 ref. (K2, G22, ST)

561-K. Tailored-to-Job Fixtures Speed Submerged-Arc Welding. Fred M. Burt. *Welding Engineer,* v. 39, Aug. 1954, p. 36-38, 52.

Method overcomes problems in fabrication of welded tanks and pressure vessels. Photographs. (K1, ST)

562-K. (French.) **Some Ideas on Welded Construction of Large Spherical Reservoirs.** Ed. Henrion. *Ossature métallique,* v. 19, nos. 7-8, July-Aug. 1954, p. 356-360.

Prescribed thickness of walls, methods of assembly and welding techniques. Photographs. (K general, CN)

563-K. (French.) **Welded Metallic Construction in the Oil Industry.** R. Chirol. *Ossature métallique,* v. 19, nos. 7-8, July-Aug. 1954, p. 369-381.

Welding materials and techniques for various units of an oil refinery. Photographs, diagrams. (K general)

564-K. (French and German.) **Automatic Arc Welding Machines and Their Industrial Application.** W. Koch. *Zeitschrift für Schweisstechnik,* v. 44, no. 7, July 1954, p. 139-148.

Electrodes and equipment for submerged-arc welding. Use of single and multiple electrodes. Diagrams, photographs. (K1)

565-K. (German.) **Problems of Soldering and Brazing.** J. Colbus. *Schweissen und Schneiden,* v. 6, no. 7, July 1954, p. 287-296.

Definition of terms, metallurgical principles, conditions for bonding, experimental procedure, effect of flux on soldering temperature and strength of joints. Diagrams, photographs, micrographs, tables, graphs. 30 ref. (K7, K8)

566-K. (German.) **Advances in the Field of Welding and Cutting. Important Recent Publications on the Metallurgy of Welding Ferrous Materials.** K. L. Zeyen. *Schweissen und Schneiden,* v. 6, no. 7, July 1954, p. 298-310.

Critical review of recent literature. 209 ref. (K general, G22)

567-K. (German.) **Bending Devices for Weld Tests.** A. Hahn. *Schweissen und Schneiden,* v. 6, no. 7, July 1954, p. 310-311.

Improved device for testing bend strength of welded joints. Photographs. (K9, Q5)

568-K. (German.) **Weldable Structural Steels.** Hubert Hauttmann. *Schweisstechnik,* v. 8, no. 5, May 1954, p. 49-51.

Criteria for evaluating weldability. Tables, graphs, photograph. 6 ref. (K9, CN)

569-K. (German.) **Welding Under Protective Gas.** Alfred Schmidt. *Schweisstechnik,* v. 8, no. 5, May 1954, p. 52-56.

History, applications and comparison of inert-gas welding. Photographs, diagrams, tables. (To be concluded.) (K1, ST)

570-K. (German.) **A Review of Welding and Soldering Methods for Aluminum and Light Metal Alloys.** Ernst Klosse. *Werkstoffe und Korrosion,* v. 5, no. 7, July 1954, p. 246-251.

Techniques and materials. Graphs. (K general, Al, Mg)

571-K. (Russian.) **Electric Arc Welding With Copper Electrodes Having Special Coatings.** N. M. Stepanov-Grebennikov and N. I. Makeev. *Vestnik Mashinostroeniia,* v. 34, no. 7, July 1954, p. 61-64.

Joining copper and brass to various steels. Corrosion tests of welds. Microstructures. Tables, micrographs, diagram. (K1, R11, Cu, CN, SS)

572-K. (Russian.) **Means of Increasing Productivity in Manual Arc Welding of 18-8 Type of Stainless Steel.** Iu. I. Kazennov, A. N. Krutikov, L. P. Kolosova and P. T. Dmitriev. *Vestnik Mashinostroeniia,* v. 34, no. 5, May 1954, p. 74-77.

Advantages of bundled electrodes and 3-phase arc. Tables, graphs, micrograph. 7 ref. (K1, SS)

573-K. (Russian.) **Automatic Welding of Circular Objects.** I. D. Volontsevich and A. A. Luchikhin. *Vestnik Mashinostroeniia,* v. 34, no. 5, May 1954, p. 77-78.

Simple, inexpensive method using ordinary apparatus. Diagram, photograph. (K1, SS)

574-K. (Russian.) **Influence of Surface Cleanliness of Tube Blanks on the Quality of Pipe Welds.** B. D. Zhukovskii and L. I. Zil'bershtein. *Vestnik Mashinostroeniia,* v. 34, no. 5, May 1954, p. 82-84.

Cleaning by shot peening under 4.0 to 4.5 atmospheres leads to better welds. Diagrams, graphs, table. (K general, G23, CN)

575-K. (Spanish.) **Design of Welded Structures.** F. Koenigsberger. *Ciencia y técnica de la Soldadura,* v. 4, no. 17, Mar.-Apr. 1954, 12 p.

Plans for structures varying according to conditions of precision, strength and quality of welds. Diagrams, photograph. (K general, ST)

576-K. (Spanish.) **Oxy-Acetylene Welding.** *Ciencia y técnica de la Soldadura,* v. 4, no. 17, Mar.-Apr. 1954, p. 127-136.

Detailed instructions for welders. Tables, diagrams. (K2, ST)

577-K. (Book.) **Projection Welding of Mild Steel.** 14 p. British Welding Research Association, 29, Park Crescent, London, W.1. 3s. 6d.

Machines and electrodes, materials to be used, types of projections, and machine settings for various thicknesses of material. (K3, CN)

578-K. (Book.) **Welding Alcoa Aluminum.** 176 p. 1954. Aluminum Co. of America, Alcoa Bldg., Pittsburgh 19, Pa. Free.

Welding methods; weld performance; quality control procedures. (K general, Al)

579-K. (Book.) **Welding Review Year Book.** J. V. Brittain, ed. 292 p. 1954. Engineering Trader Ltd., Morley House, 26-30 Holborn Viaduct, London, E.C.1, England. 9s.6d.

Practical welding, soldering and brazing processes. (K general)

580-K. **Titanium Brazing.** *Light Metal Age,* v. 12, Aug. 1954, p. 18 + 4 pages.

Torch, induction and resistance heating. Diagrams. (K8, Ti)

581-K. **Increase Welding Speeds With Powdered Metal.** L. K. Stringham. *Machine and Tool Blue Book,* v. 49, June 1954, p. 166-168, 170.

Advantages of using heavily coated electrodes containing large quantities of powdered metal. Table, photographs. (K1)

582-K. **New Tin-Depositing Flux for Soldering Aluminum.** Donald C. Burch and Robert L. Simpkins. *Materials & Methods,* v. 40, Aug. 1954, p. 86-89.

Stannous chloride base reaction flux used with zinc-tin or zinc-aluminum alloys meets most requirements for successful soldered joints. Photographs, tables. (K7, Al)

583-K. **The Metallurgy of Welding.** W. I. Pumphrey. *Metallurgia,* v. 50, no. 297, July 1954, p. 3-9.

Metallurgical changes during welding, their effect on properties of the weld metal and the heat affected zone of the parent metal. Micrographs, tables. 5 ref. (K9)

584-K. **Dry Hydrogen Brazing for High Strength Alloys.** Floyd C. Kelley. *Product Engineering,* v. 25, Aug. 1954, p. 156-160.

Method and advantages of process applied to high-strength alloys. Photographs, diagrams, table, micrograph. (K8)

585-K. **The Welding of Monel and K-Monel.** F. A. Ball. *Sheet Metal Industries,* v. 31, no. 328, Aug. 1954, p. 685-689.

Resistance and flash welding methods. Tables, micrographs, photographs. 3 ref. (K3, Ni-d)

586-K. **The Welding of Magnesium Base Alloys.** Lester F. Spencer. *Sheet Metal Worker,* v. 45, Aug. 1954, p. 82-84, 86, 118.

Gas shielded-arc and resistance methods. Tables. (K1, K3, Mg)

587-K. **Fasteners. Design for Specials Becomes Standard.** William R. Wolfe. *Steel,* v. 135, Aug. 16, 1954, p. 96-98.

Advantages of multifunction fasteners designed for a special application. Examples. Photographs, diagrams. (K13)

588-K. (French.) **The Repair of Grey Cast Iron Castings in Great Britain.** A. B. Everest and F. A. Ball. *Fonderie,* 1954, no. 102, July, p. 4031-4039.

Economic and other factors affecting repair practices. Welding methods. Photographs. (K general, CI)

589-K. (French.) **Recent Developments in the Welded Construction of Electrical Equipment.** M. Sherrington. *Revue de la Soudure (Brussels),* v. 10, no. 2, 1954, p. 71-78.

Welding of hydraulic presses, transformers, alternators, safety shields, etc. Photographs. (K general)

590-K. (French.) **News of the International Welding Institute; Report of Committee 1. Gas Welding.** C. G. Keel. *Revue de la Soudure (Brussels),* v. 10, no. 2, 1954, p. 86-87.

Classification of deposited metals and selection of a weld test method. Tables. (K2)

591-K. (French.) **News of the International Welding Institute. Tests,**

Measurements and Controls of Welds. Georges A. Homes. *Revue de la Soudure (Brussels),* v. 10, no. 2, 1954, p. 88-93.

Radiography, weld classification, ultrasonics, radioisotopes. Table. (K9)

592-K. (French.) **New Practical Test Method for Checking Quality of Spot Welds on Low-Alloy Semihard Steel.** P. Joumat. *Revue de la Soudure (Brussels),* v. 10, no. 2, 1954, p. 100-104.

Torsion-shear method of investigating welds. Photographs, micrographs. (K9, K3, AY)

593-K. (German.) **Electric-Arc Welding in Shipbuilding.** G. Jung. *Elektrotechnische Zeitschrift,* v. 6, Ausgabe B, no. 7, July 1954, p. 225-230.

Types of electric-arc welding used in shipbuilding and electrical equipment. Photographs, graphs, diagrams, tables. 2 ref. (K1, ST)

594-K. Now Titanium Can Be Furnace-Brazed. R. A. Long. *American Machinist,* v. 98, Aug. 16, 1954, p. 117-119.

Development of brazing filler alloy and low-temperature brazing. Photograph, diagrams, micrograph. (K8, Ti)

595-K. Soldering Aluminium. A Survey of Progress. J. C. Bailey and J. A. Hirschfield. *Research,* v. 7, Aug. 1954, p. 320-326.

Methods, solders and properties of joints. Tables, photograph. 6 ref. (K7, Al)

596-K. Welding Procedure for Welding Tubes in Heat Exchangers. W. E. Battles. *Welding Journal,* v. 33, Aug. 1954, p. 739-742.

Experimental assembly set-up for development of suitable procedures and specifications for fabricating tubular heat exchangers. Photographs. (K general, CN)

597-K. High Production Application of Resistance Welding. C. D. Shultheis. *Welding Journal,* v. 33, Aug. 1954, p. 768-777.

Steadily increased use of resistance welding as a production tool and its impact on the high production of ranges, dryers, etc. Diagrams, photographs, graph. (K3)

598-K. Welding Aluminum Sheet. F. C. Geibig. *Welding Journal,* v. 33, Aug. 1954, p. 784-788.

Designed to help welding operators who have infrequent occasion to weld aluminum by the oxy-acetylene process. Diagrams, photographs. (K2, Al)

599-K. Powdered Iron Invades Electrode Designs. L. K. Stringham. *Welding Journal,* v. 33, Aug. 1954, p. 788-789.

Efficient use of arc heat by powdered metal coatings means lower welding costs through higher welding speeds, lower cleaning costs because of less spatter and undercut and smoother and more uniform welds. Photographs, table. (K1)

600-K. Submerged Arc Welding of Chromium-Bearing Steels. Clarence E. Jackson and Arthur E. Shrubsall. *Welding Journal,* v. 33, Aug. 1954, p. 752-758.

Influence of current, voltage and speed of travel on weld area and recovery of chromium, silicon, nickel, manganese and other alloys. Tables, graphs, photograph. 5 ref. (K1, AY)

601-K. Spot Welding Thin Aluminum. I. W. Johnson. *Welding Journal,* v. 33, Aug. 1954, p. 759-762.

Slope control with single-phase equipment provides means of simulating wave shape of stored energy discharge necessary for welding thin aluminum alloy sheets. Tables, photographs, graph. (K3, Al)

602-K. The Welding of Heavy Sections. W. Spraragen and M. A. Cordovi. *Welding Journal,* v. 33, Aug. 1954, p. 369S-386S.

Preheating, peening, intermediate stress-relieving, special electrodes and techniques are devices successfully used to facilitate welding heavy sections. Tables, diagrams, photographs, macrographs. 18 ref. (K1, G23, J1, ST)

603-K. Designing and Making Welded Structural Steel Members for Cyclic Loading. *Welding Journal,* v. 33, Aug. 1954, p. 386S-387S.

Precautions to be used in designing and making structures which are subjected to cyclic loading. (K general, T26)

604-K. The Spot Welding of Titanium. E. R. Funk. *Welding Journal,* v. 33, Aug. 1954, p. 397S-400S.

Mechanical properties of titanium spot welds using different settings and thicknesses of material. Graphs, tables, photograph. 2 ref. (K3, Q general, Ti)

605-K. Effects of Oxygen and Nitrogen in Welding Titanium Alloys. James H. Johnston. *Welding Journal,* v. 33, Aug. 1954, p. 414S-416S.

Maximum tolerable oxygen and nitrogen contamination levels in welds in various alloys of titanium as determined through simulated welds in these alloys. Graphs, table, photograph. 3 ref. (K1, Ti)

606-K. Weldments in the Titanium-Manganese Sheet Alloy RC-130A. H. M. Meyer. *Welding Journal,* v. 33, Aug. 1954, p. 417S-421S.

Influence of heat treatment in overcoming embrittlement in weldments in commercial titanium sheet alloy containing 6.5 to 8% manganese and effects of surface contamination. Graphs, tables, micrographs. (K general, Q23, Ti)

607-K. 30-Ft Diameter All-Welded Test Tank. John Vasta and Frank W. Dunham. *Welding Journal,* v. 33, Aug. 1954, p. 422S-432S.

Design and construction and comparison of theoretical solutions to some of the problems. Experimental test data taken during proof testing. Diagrams, graphs, photograph. (K9, ST)

608-K. Sigma Welding of Carbon Steels. T. L. McElrath and R. T. Telford. *Western Machinery and Steel World,* v. 45, Aug. 1954, p. 97-100.

Applications and process limitations. Filler rod development. Tables, diagrams, graph. (K1, CN)

609-K. Submerged Automatic Arc Welding With Several Electrodes Simultaneously. V. S. Volodin. *Henry Brutcher, Altadena, Calif., Translation no.* 3016, 3 p. (From *Avtogennoe Delo,* v. 24, no. 2, 1953, p. 25-26.)

Submerged automatic welding process using two or more electrodes simultaneously. Tables, photographs. (K1, CN)

610-K. (Japanese.) Quality Control of Spot Welding of Light Alloys. B. Nakamura. *Metals (Japanese),* v. 24, no. 7, July 1954, p. 578-581.

Equipment, tests, welders' records and operations control. Photographs, charts. (K3, S12, Al)

611-K. Ceramic-to-Metal Seals for Vacuum Tubes. Thomas L. Evans. *Ceramic Age,* v. 64, sec. 1, Aug. 1954, p. 9-13; disc., p. 13-14.

Requirements and methods. Photographs, diagrams. (K11)

612-K. Welding Copper and Copper Alloy Castings. A. O. Dodge. *Foundry,* v. 82, Sept. 1954, p. 165, 168-170.

Techniques for applying cast-weld construction to aluminum bronze castings. Photographs. (K general, Cu)

613-K. New Automatic Welding Procedures at Navy's Mare Island Shipyard. *Industry & Welding,* v. 27, Sept. 1954, p. 35-37.

Typical applications in construction of submarines. Photographs. (K1, ST)

614-K. High Temperature Brazing Alloys. George D. Cremer, Frank J. Fillipi and Richard S. Mueller. *Industry & Welding,* v. 27, Sept. 1954, p. 40-42, 97.

Properties and applications of various alloys. Photographs. (K8)

615-K. Resistance Welding Eliminates Parts, Speeds Production at Delco-Remy. J. Raymond Wirt. *Industry & Welding,* v. 27, Sept. 1954, p. 52-54.

Advantages of welding over soldering or riveting. Photographs. (K3)

616-K. 21 Ways to Lower Cost of Arc Welding for Production. Robert Wilson. *Industry & Welding,* v. 27, Sept. 1954, p. 58-62, 64-65.

Design, material selection, welding techniques and finishing operations. Diagrams, photograph. (K1)

617-K. Metallic-Arc Welding of Spheroidal-Graphite Cast Iron. F. A. Ball and D. R. Thorneycroft. *Institute of British Foundrymen, Paper no.* 1095, 1954, 16 p.

Mechanical properties of joints using nickel-iron and aluminum bronze electrodes. Analysis of structures of weld metal and adjacent cast iron. Tables, photographs, micrographs, graphs, diagrams. 7 ref. (K1, M27, Q general, CI)

618-K. Welding Without Prebeveling Lowers Fabricating Costs. R. C. Hermon. *Iron Age,* v. 174, Aug. 26, 1954, p. 104-105.

Arcair gouging of square butted joints. Photographs. (K general, G22)

619-K. Welding Aluminium-Alloy Structures. J. E. Tomlinson. *Light Metals,* v. 17, Aug. 1954, p. 250-253.

Recent progress and present practice in arc welding methods. Table, photographs, graph. 9 ref. (K1, Al)

620-K. Compressed Glass-to-Metal Seals. H. Adam. *Society of Glass Technology, Journal,* v. 38, no. 182, June 1954, p. 285T-296T.

Theoretical and practical concepts regarding compression factor. Diagrams, graphs, photographs. 8 ref. (K11)

621-K. Pushbutton Welding. A Step Closer. R. W. Tuthill. *Steel,* v. 135, Aug. 30, 1954, p. 76-77.

New developments in consumable-electrode gas-shielded welding step up speeds while reducing costs and need for operator skill. Graphs, photographs. (K1)

622-K. Automatic Welding of Long Seams. *Tool Engineer,* v. 33, Sept. 1954, p. 74-76.

Equipment and methods in building railroad cars. Photographs. (K1)

623-K. Ultrasonic Fluxless Soldering Technique. Glenna S. McWhirter.

Welding Engineer, v. 39, Sept. 1954, p. 26-27.

Process and advantages. Photographs. (K7, Al, Cu, Ag, Mg)

624-K. (French.) **Submerged Arc Welding in the Boiler Industry.** Luigi Rivoira and Franco Rivoira. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 319, 321.

Welding of water tanks and bottles for liquid gas. (K1, ST)

625-K. (French.) **Butt-Welding Machines for Large-Size Sheets.** *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 323-325.

Arc-welding machine which incorporates equipment for removal of excess weld metal. Photographs. (K1, ST)

626-K. (German and French.) **Repairing a Fire Box.** H. Siegenthaler. *Zeitschrift für Schweisstechnik,* v. 44, no. 8, Aug. 1954, p. 173-175.

Procedure of weld repairing a locomotive fire box. Photographs. (K general, CN)

627-K. (German and French.) **Welding Sheet Aluman Without Distortion or Cracking.** H. Siegenthaler. *Zeitschrift für Schweisstechnik,* v. 44, no. 8, Aug. 1954, p. 175-177.

Techniques for fabrication and repair. Photographs. (K general, Al)

628-K. (German.) **Blind Riveting in Light-Metal Construction.** Leo Kirste. *Aluminium Ranshofen, Mitteilungen,* v. 2, no. 1, June 1954, p. 13-15.

Methods of riveting. Diagrams. (K13)

629-K. (German.) **Butt Weld or Ball Joint in Pipeline Construction?** Hans Geilenkeuser. *Gas und Wasserfach,* v. 95, Ausgabe Gas, no. 15, Aug. 1, 1954, p. 479-481.

Relative merits of two types of pipe connections on basis of calculations and practical experience. Diagrams. (K1, K13)

630-K. (German.) **Modern Binders and the Gluing of Metals.** *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 23, Aug. 11, 1954, p. 777.

Adhesive properties of several synthetic compounds on resin base. 1 ref. (K12)

631-K. (Swedish.) **Good Old Vintage.** *Svetsaren,* v. 19, no. 1, 1954, p. 1-5.

Welding repairs carried out on various old English water pumping machinery. Types of electrodes and fatigue tests on weldments. Photographs, diagram. (K1, Q7)

632-K. (Swedish.) **Söderströmsbron, an All-Welded Railroad Bridge of St 44.** *Svetsaren,* v. 19, no. 1, 1954, p. 6-13.

Design, tests of material and welding alloys and construction techniques. Diagrams, tables, photographs. (K general, T26, CN)

633-K. (Swedish.) **New Hard Welding Alloy With High Resistance to Wear.** Tore Noren and Torvald Hellerstrom. *Svetsaren,* v. 19, no. 1, 1954, p. 14-20.

Development and application of OK H 13 silicon-chromium base electrodes. Micrographs, photographs, table, graph. 9 ref. (K1, L24, Si, Cr, AY)

634-K. (Book.) **Annual Report for 1953-54.** 48 p. The British Welding Research Association, 29 Park Crescent, London W. 1., England.

Concise account of the Association's activities. List of confidential reports which have been issued to members. Research notes. (K general)

635-K. **Welding Standardization: National and International.** E. P. S. Gardner. *British Welding Journal,* v. 1, Aug. 1954, p. 337-344.

Procedures in initiation and drafting of standards. Diagrams, table. (K general, S22)

636-K. **Spot Welding of High-Strength Aluminium Alloys.** H. E. Dixon and J. E. Roberts. *British Welding Journal,* v. 1, Aug. 1954, p. 351-370.

Effect of surface preparation, current wave shape and electrode load cycle on properties of spot welds. Diagrams, tables, graphs, micrographs. 3 ref. (K3, Al)

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Chemical composition is less critical in avoiding welding cracks than correct control of the assembly and welding sequences. Examples of good techniques. Diagrams, photographs, graph. (K general, CN)

638-K. **Practical Aspects of Automatic Welding.** D. E. Baty. *British Welding Journal,* v. 1, Sept. 1954, p. 392-396.

Experience on welding of water-tube boiler drum and construction of an all-welded tanker. Photographs, tables, diagrams. (K1, CN)

639-K. **Automatic Argon-Arc Welding of Low-Alloy Steel Sheet.** F. J. Wilkinson. *British Welding Journal,* v. 1, Sept. 1954, p. 397-402.

Equipment and techniques for satisfactory welding of SAE 4130 sheet. Tables, diagram, photographs. (K1, AY)

640-K. **The 'Twin-Argon' Welding Process.** J. A. Donelan. *British*

Welding Journal, v. 1, Sept. 1954, p. 403-408.

Arc phenomena, equipment design, applications and metallurgical aspects of inert-gas shielded polyphase tungsten-arc process for welding aluminum tube. Diagrams, graphs, photographs, micrographs. (K1, Al)

641-K. Transformation Temperature of Alloy Steels Related to Weldability With Low-Hydrogen Electrodes. C. L. M. Cottrell. *British Welding Journal,* v. 1, Sept. 1954, p. 409-412.

Cracking of low alloy steels is related to temperature of completion of austenite transformation in the weld. Table, graphs. 8 ref. (K9, K1, N8, AY)

642-K. Energy Distribution in Argon-Shielded Welding Arcs. J. F. Lancaster. *British Welding Journal,* v. 1, Sept. 1954, p. 412-426.

Heat losses at anode and cathode are related to potential drops for d.c., shielded-arc welding. Graphs, tables, diagrams, photograph. 15 ref. (K1)

643-K. Physical Data on Commercial Silver Solders. Karl M. Weigert. *Electrical Manufacturing,* v. 54, Sept. 1954, p. 143-146.

Thermal and mechanical properties of commercial grades. ASTM standards and government specifications. Tables. 7 ref. (K7, P12, Q general, S22, In, Ni, Cd, Zn, Cu, Ag)

644-K. Bus Copper Field-Welded by New Process. W. C. Chirgwin. *Electric Light and Power,* v. 32, Sept. 1954, p. 104-105.

Helium inert-gas shielded-arc welding process using deoxidized copper rod and borax flux. Table, diagram, photographs. (K1, Cu)

645-K. The Design and Manufacture of Welded Pressure Vessels. T. B. Webb. *Institute of Petroleum, Journal,* v. 40, Aug. 1954, p. 224-235; disc., p. 235-239.

Forming, welding and stress-relieving methods, design techniques, relations between stresses and fluid pressures, stress distribution studies. Photographs, diagrams, table. 2 ref. (K general, J1, AY, CN)

646-K. Powdered Metal Electrodes Cut Welding Costs, Gain Wider Acceptance. A. C. Ward. *Iron Age,* v. 174, Sept. 9, 1954, p. 126-127.

Contact electrodes produces quality welds at high speeds for flat or horizontal welding. Photographs. (K1, CN)

647-K. Fabricator Lowers Tooling Costs, Improves Productivity, Through Wide Use of Stud Welding. J. W. Jones. *Iron Age,* v. 174, Sept. 16, 1954, p. 161-164.

Techniques in production of large equipment. Tables, photographs, diagram. (K1, ST)

648-K. High Temperature Alloy Fastenings Require Careful Fabricating, Precision Heat Treating. T. W. Harker. *Iron Age,* v. 174, Sept. 16, 1954, p. 171-173.

Materials, fabrication, and heat treatment of bolts for high-temperature applications. Photographs, diagram, table. (K13, G general, J general, SS)

649-K. Rebuilding Steel Mill Rolls. Robert Hall. *Iron and Steel Engineer,* v. 31, Sept. 1954, p. 109-112.

Equipment and techniques for reclaiming worn or damaged rolls by automatic arc welding. Photographs. (K1, F23, ST)

650-K. Economical Roll Reclamation. J. Goldstein. *Iron and Steel Engineer,* v. 31, Sept. 1954, p. 112-114.

Machines and procedures used for submerged-arc repair of rolls. Tables, photographs, diagrams. (K1, F23, ST)

651-K. Welding Aluminium-Alloy Structures. J. E. Tomlinson. *Light Metals,* v. 17, Sept. 1954, p. 291-293.

Recent progress, including automatic submerged arc process. Table, micrographs. (To be continued.) (K1, Al)

652-K. Changing Trends in Mechanical Fasteners. W. C. Stewart. *Machine Design,* v. 26, Sept. 1954, p. 220, 222, 224.

Characteristics of bolts, nuts, screws and rivets. Photographs. (K13)

653-K. Titanium Joining. *Machinery Lloyd (Overseas Ed.),* v. 26, Aug. 14, 1954, p. 89, 92.

Improved procedures in brazing and hard soldering. (K8, K7, Ti)

654-K. Welding Reduces Cost of Textile Machinery Parts. Dimitri G. Soussloff. *Modern Machine Shop,* v. 27, Sept. 1954, p. 158-160, 162-164.

Specific case illustrates design, construction and additional objectives realized from arc-welded design. Photographs, diagram. (K1, ST)

655-K. The Application of Lock Joints to Sheet Metal Work. W. Cookson. *Sheet Metal Industries,* v. 31, no. 329, Sept. 1954, p. 725-728, 737.

Applications and advantages of various types of mechanical joints. Diagrams. (K13)

656-K. Testing of Solder Fluxes. P. M. Fisk. *Sheet Metal Industries,*

v. 31, no. 329, Sept. 1954, p. 743-745, 747.
Evaluation of various tests. 8 ref. (K7)

657-K. Compressed Glass-to-Metal Seals. H. Adam. *Society of Glass Technology, Journal,* v. 38, no. 182, June 1954, p. 285T-296T + 1 plate.
Theoretical and practical concepts regarding the compression factor. Diagrams, graphs, photographs. 6 ref. (K11)

658-K. Porosity in Low Carbon Steel Tungsten Inert Arc Welds. A. J. Rosenberg and B. Townshend. *Steel Processing,* v. 40, Sept. 1954, p. 569-571.
Factors contributing to porosity and methods of avoidance. Tables. graphs. (K1, K9, CN)

659-K. Resistance Welding Developments at Vauxhall Motors. II. *Welding and Metal Fabrication,* v. 22, Aug. 1954, p. 302-308.
Design and operations of welding assembly lines. Photographs, diagrams. (K3)

660-K. Directory of Welding and Fabricating Equipment. III. Hardfacing Electrodes. *Welding and Metal Fabrication,* v. 22, Aug. 1954, p. 319-322.
Tables covering equipment used by several British concerns. Tables. (K general, A10)

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Inspection of material, welding, fabrication and final inspection routines. Photographs. (To be continued.) (K general, CN)

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Improvements in machines and results of recent research. Graphs, diagrams, table. 17 ref. (To be concluded.) (K3, Al)

663-K. (German.) **Critical Consideration on the Tinning of Aluminum With the Aid of Ultrasound.** Rolf Göbel. *Nachrichtentechnik,* v. 4, no. 7, July 1954, p. 325-329.
Design and operation of ultrasonic soldering equipment, effects of fluxes and additions to the tin on quality of soldered joint. Diagrams, photographs. 8 ref. (K7, Al, Sn)

664-K. (Italian.) **Economic and Technical Comparison Between Oxy-Acetylene and Electric Welding of Light Alloys in Inert Gas.** P. Provenzali. *Alluminio,* v. 23, no. 4, 1954, p. 377-390.
Techniques, equipment, costs and advantages of each method. Tables, photographs. (K1, K2, Al)

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Gas-shielded arc welding using a nonconsumable tungsten electrode. Photographs, table. (K1, Ti)

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Survey of use and capabilities of oxy-fuel gas flame in welding, cutting and treatment of metals. Photographs, table, graph. (K2, G17, J2)

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Problems encountered and recommended materials for use above 1200° F. Photographs, table. 6 ref. (K13, SG, AY)

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Investigation of embrittlement of powder metal due to effect of porosity and role of copper in iron-copper composition. Photographs, diagrams, tables, micrographs. 3 ref. (K1, H11, Fe, Cu, CN)

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Advantages of the rutile-plus iron powder type electrodes, properties, recommended techniques to get best results. Photographs, diagrams, graphs, tables. (K1, H11, Fe, ST)

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Training methods used by General Motors for resistance welder maintenance men. Tables. (K3, A3)

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Methods which may be used in overcoming difficulties in silver brazing aluminum-bronze, beryllium-copper, stainless steel, chromium carbide, molybdenum, titanium, zirconium and tantalum. 6 ref. (K8, Ag, Cu, SS, C-n, Cr, Mo, Zr, Ta)

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Welding procedures for similar and dissimilar metals including type of gas, voltage, current, gas flow and speeds. Photographs, table. (K1)

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Oxy-acetylene flame processes used in producing underground piping. Photographs. (K8, K2, CI)

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Fusion welding, butt welding in air, brazing, spot welding and riveted joints. Tables, diagrams, photographs. 24 ref. (K general, Mo)

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Fusion, resistance welding and brazing of high precision stainless steel tubing. Photographs. (K1, K2, K3, K8, SS)

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Pressure and diffusion welding of noble metals to brass to form electric contacts. Effect of various annealing times and temperatures. Photographs, micrographs, graphs, table. 3 ref. (K5, N1, J23, Cu, EG-c)

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Gas, arc, resistance and argon-shielded arc methods. Diagrams. 6 ref. (K2, K1, K3, Al, EG-a)

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Comparison of methods. Joining steel and aluminum and cold soldering aluminum and lead. Diagrams. 1 ref. (K5, K7, ST, Al, Pb)

682-K. (Russian.) **Welding of Crack in Bottom of High-Pressure Boiler Drum.** B. B. Solov'ev. *Energetik,* v. 2, no. 8, Aug. 1954, p. 9-11.

Prewelding treatment and temperature control methods. Graph, table, diagrams. (K general, AY)

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First principles of each process and its scientific application in mass production, with emphasis on design and production requirements. (K3)

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Requirements, advantages, dimension specifications. Table. (K1, Zr, W)

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Procedures for increasing service life and reliability of tools. Photographs, table. (K8, G18, C-n)

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Techniques for producing sound joints. Photograph. (K3, Ta)

687-K. Weldability of Copper-Base Alloys. *Industry & Welding,* v. 27, Oct. 1954, p. 86-90, 92.

Proper techniques for various alloys. Diagrams, table. (K9, Cu)

688-K. The Properties and Uses of Metal Adhesives. R. A. Johnson. *Sheet Metal Industries,* v. 31, no. 330, Oct. 1954, p. 829-835, 841.

Types, methods of use and applications. Tables, photographs, graphs, diagram. 12 ref. (K12)

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Methods developed to combat effects of hydrogen in welded joints. Graphs, table. 2 ref. (K9, ST)

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Safety rules and cleaning methods. (K general, A7, CN)

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Requirements to be met and techniques for satisfactory production. Photographs. (K general, CN)

692-K. Influence of Hydrogen, Oxygen, and Nitrogen Upon Formation of Hot Cracks in 18-8 Steel Welds. I-III. D. I. Medovar. *Henry Brutcher, Altadena, Calif., Translation nos.* 3369-3371, 38 p. (From *Avtomaticheskaya Svarka,* v. 6, no. 4, 1953, p. 3-23.)

Effect of gases on structure and properties of welds in 18-8 steel. Diagrams, micrographs, graphs, tables. 35 ref.
(K general, Q general, SS)

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Principles and specific problems. Micrographs, diagrams, tables. 9 ref. (K8, Al)

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Effects of welding current and preliminary heat treatment on mechanical properties of chromium steel. Graphs, diagram.
(K3, Q general, AY)

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Effects of current variables on weld quality. Tables, graphs, micrographs. 2 ref. (K3, CN)

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Variations in preparations and welding techniques. Micrographs, tables, graph. (K1, K2, Al, Mg)

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Problems relative to preparation of pieces, assembling, welding, deformation and reduction of stresses. Photographs, charts, diagrams.
(K general)

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Microscopic study of fusion, resistance, cold pressure, condenser and discharge welded steel and nonferrous metals. Micrographs. 9 ref.
(K general, M27, ST, EG-a)

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Tests to determine quality of work for the purpose of setting standards for welders. Tables, diagrams, photographs, micrographs. (K9, A3)

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(K3, AY)

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Relation of transition welds to their suitability and strength for high-temperature service. Diagrams, graphs, micrographs, photographs, table. 6 ref. (K general, AY, SS)

702-K. Spot Welding of Tinplate. M. J. Richard and D. W. Petchey. *British Welding Journal,* v. 1, Oct. 1954, p. 433-440.

Longest electrode life obtained with copper-chromium alloy tips using short weld times, large included-angle cone tips and low loads. Photograph, tables, oscillogram. 8 ref.
(K3, CN, Sn)

703-K. Operating Data for the Murex Hot-Crack Testing Machine. E. C. Rollason and D. F. T. Roberts. *British Welding Journal,* v. 1, Oct. 1954, p. 441-447.

Practical significance of test data for mild and stainless steel electrode

deposits. Photographs, diagrams, tables, graphs. 4 ref. (K9, CN, SS)

704-K. A New Process of Stud Welding. W. P. van den Blink, E. H. Ettema, and P. C. van der Willigen. *British Welding Journal,* v. 1, Oct. 1954, p. 447-454.

Use of a semiconductor cartridge to start the arc and to determine distance between the stud and plate. Diagrams, photographs. 3 ref. (K1, CN)

705-K. The Fusion Welding of Aluminium Alloys. Introduction. I. A Survey of Published Information on the Fusion Welding of Heat-Treatable Aluminium Alloys. H. E. Dixon. **II. Review of Published Information on Weld Cracking in Aluminium Alloys, With Particular Reference to Al-Mg-Si Alloys.** W. G. Hull and D. Adams. **III. Dilution and Uniformity in Aluminium Alloy Weld Beads.** P. T. Houldcroft. *British Welding Journal,* v. 1, Oct. 1954, p. 455-472.

Literature review and experimental study of factors influencing welding process. Tables, graphs, diagrams, micrograph. 47 ref. (K general, Al)

706-K. Field Welding Heavy-Wall Vessels. F. A. Upson. *Petroleum Refiner,* v. 33, Oct. 1954, p. 117-120.

Difficulties encountered, precautionary measures and methods in obtaining sound welds in heavy plate under field conditions. (K general, CN)

707-K. Titanium and Zirconium. F. Hirschmann. *Welding and Metal Fabrication,* v. 22, Oct. 1954, p. 377-380.

Argon-arc welding of pure metals and their alloys. Diagrams, table, micrographs. 32 ref. (K1, Ti, Zr)

708-K. The Spot Welding of Aluminimum Alloys. H. E. Dixon. *Welding and Metal Fabrication,* v. 22, Oct. 1954, p. 384-387.

Machine developments and research progress. Table, graphs. 37 ref. (K3, Al)

709-K. Directory of Welding and Fabricating Equipment. IV. Metal-Arc Welding Electrodes. Cast Iron. *Welding and Metal Fabrication,* v. 22, Oct. 1954, p. 397-400.

Tabulated data on names and characteristics of British electrodes for welding cast iron. (To be continued.) (K1, CI)

710-K. (French.) **Contribution to the Tensiometric Study of Adhesive Joining of Metals.** Henri L. Rosano and G. Diehl. *Recherche Aéronautique,* 1954, no. 40, July-Aug., p. 41-49.

Study of differently treated duralumin surfaces. Effects of orientation, constraint and geometry on joint strengths. Diagrams, table, photograph. 9 ref. (K12, Al)

711-K. (French.) **Studies on Argon-Arc Welding.** J. Brillie. *Soudure et Techniques connexes,* v. 8, nos. 7-8, July-Aug. 1954, p. 195-202; disc., p. 202-204.

High-speed photographic study. Applications of Nertalic process on aluminum, copper and stainless steel. Drawings, photographs. (K1, Al, Cu, SS)

712-K. (French.) **Production of Coated Electrodes for Arc Welding.** P. Ducornet. *Soudure et Techniques connexes,* v. 8, nos. 7-8, July-Aug. 1954, p. 219-222; disc., p. 223-225.

Modern production methods and research trends. (K1, T5)

713-K. (German.) **Use and Behavior of Inserts for Light Alloy Articles.** F. Walther. *Aluminium,* v. 30, no. 10, Oct. 1954, p. 417-421.

Advantages, techniques and strength of inserts for threaded joints in aluminum alloys. Diagrams, tables, graph, photographs. (K13, Q23, Al)

714-K. (German.) **Principles of Welding Cast Light-Metal Alloys.** E. Klosse. *Metall,* v. 8, nos., 19-20, Oct. 1954, p. 764-765.

Preparation and preheating. Principles of the chief methods of welding aluminum and magnesium alloys. 1 ref. (K general, Al, Mg)

715-K. (German.) **Spot Welding of Nonferrous Metals.** R. Plöchinger. *Metall,* v. 8, nos. 19-20, Oct. 1954, p. 766-767.

Principles and factors to consider in adapting steel spot welding equipment to nonferrous metals and alloys. Diagram, photographs, table. (K3, EG-a)

716-K. New Inert Arc Welding Process Speeds Fabrication of Mild Steel. C. H. Jennings and H. J. Bischel. *Industry & Welding,* v. 27, Nov. 1954, p. 58-60, 63-65.

New coated wire electrode for use with argon shielding. Photographs, table. (K1, CN)

717-K. Oxy-Acetylene Welding of Copper. *Industry & Welding,* v. 27, Nov. 1954, p. 47-49, 107-109.

Welding techniques, joint preparation, preheating and metallurgical changes. Photograph, tables. (K2, Cu)

718-K. Improved Rods and Techniques Overcome Crack Sensitivity in Magnet Steel Welds. J. J. Obrzut. *Iron Age,* v. 174, Oct. 28, 1954, p. 90-91.

Rod and coating compositions, requirements for welded electromagnets. Photographs. (K1, AY)

719-K. Titanium Brazing. II. *Light Metal Age,* v. 12, Oct. 1954, p. 28-29.
Structure of films formed on heated titanium, fluxing reagents, flow of brazing metals and effects of heating variables. Table. (K8, Ti)

720-K. Zinc Die Cast Threaded Fasteners. Ernest W. Horvick. *Materials & Methods,* v. 40, Oct. 1954, p. 110-111.
Design advantages and low-cost production result from process. Photographs. (K13, Zn)

721-K. Stub-Ending Drill Collars by Electric-Arc Welding. W. S. Bachman. *Oil and Gas Journal,* v. 53, Nov. 1, 1954, p. 85-87.
Process, welding techniques, preheat, stress-relief after welding and the design of the weld. Photographs, diagram, graph. (K1, J1, ST)

722-K. Arc Welding; Old Process Refined. C. H. Jenning and H. J. Bichsel. *Steel,* v. 135, Nov. 1, 1954, p. 84-85.
New coated electrode makes straight polarity operation possible. Photographs, table, graph. (K1)

723-K. New Ways of Automatic Arc Welding. T. B. Jefferson. *Welding Engineer,* v. 39, Nov. 1954, p. 36-39.
Techniques for increasing welding rates. Diagrams, photographs. (K1, CN)

724-K. Nitrogen for Tig Welding? T. B. Jefferson. *Welding Engineer,* v. 39, Nov. 1954, p. 43-45.
Tests indicate nitrogen may be suitable for gas-shielded welding of copper and other nonferrous metals. Photographs, table. 6 ref. (K1, Cu)

725-K. Flash Welding High Strength Alloy Steels. W. G. Fassnacht. *Welding Journal,* v. 33, Oct. 1954, p. 937-944.
Suggestions for solving the most important problems encountered in this type of welding. Photographs, table, graphs. (K3, AY)

726-K. Prediction of Angular Distortion Caused by One-Pass Fillet Welding. T. Kumose, T. Yoshida, T. Abbe and H. Onoue. *Welding Journal,* v. 33, Oct. 1954, p. 945-956.
Experimental data on mild steel tee joints. Effects of plastic and elastic prestrain. Graphs, diagrams, photographs. 2 ref. (K9, Q21, Q23, CN)

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Schedule developed for four widely used alloys in 257 combinations of alloy and thicknesses with eight machine settings. Photographs, graphs, tables. 5 ref. (K3, Al)

728-K. Metallurgical Aspects of Welding Precipitation-Hardening Stainless Steels. C. W. Funk and M. J. Granger. *Welding Journal,* v. 33, Oct. 1954, p. 496S-508S.
Response of welded joints to heat treatments and effects of such treatments and weld defects on mechanical properties. Graphs, tables, micrographs, photographs. 13 ref. (K general, J27, Q general, SS)

729-K. Performance of Weldments and Primo Plate of ABS-B Steel. W. S. Pellini and E. W. Eschbacher. *Welding Journal,* v. 33, Oct. 1954, p. 524S-531S.
Bulge-test and tensile evaluation of welds made with various electrodes. Tables, diagrams, graphs, micrograph, photographs. 6 ref. (K1, Q23, CN)

730-K. Series Spot Welding of 0.036-In. Auto Body Steel. Ernest F. Nippes and Frederick H. Domina. *Welding Journal,* v. 33, Oct. 1954, p. 535S-544S.
Effects of electrode shape, force, time, fusion zone diameter, material thickness, surface preparation and spot spacing on strength of welds. Tables, photographs, diagrams, graphs. 7 ref. (K3, Q23, CN)

731-K. (German.) **Physical Laws of Spot Welding Steel Sheets.** A. Matting and E. Rubo. *Schweissen und Schneiden,* v. 6, no. 9, Sept. 1954, p. 365-370.
Limitations of mathematical and physical analyses for determining optimum conditions. Functional relations of various factors. Micrograph, diagram, graph. 6 ref. (K3, CN)

732-K. (German.) **Welding of Large Clad Steel Containers.** M. Komers. *Schweissen und Schneiden,* v. 6, no. 9, Sept. 1954, p. 374-379.
Assembly, welding, control and heat treating of oil refinery structures. Photographs, diagrams, micrograph. 3 ref. (K general, J general, ST)

733-K. (German.) **Advances in the Field of Welding and Cutting. Important Recent Publications on Electric-Arc Welding Processes.** J. Ruge. *Schweissen und Schneiden,* v. 6, no. 9, Sept. 1954, p. 380-383.
Critical review. Tables. 80 ref. (K1, G22)

734-K. (German.) **Describing the Chemical Character of Silicate Melts, Especially of Powders for Welding With the Submerged Electric Arc.** Paul Beyersdorfer. *Silikattechnik,* v. 5, no. 9, Sept. 1954, p. 381-384.

Studies of various powders, fluxes and coatings for submerged-arc welding. Table. 6 ref. (K1)

735-K. (German and French.) **Phenomena of Diffusion During Welding.** Carl G. Keel. *Zeitschrift für Schweisstechnik*, v. 44, no. 10, Oct. 1954, p. 212-217.

Reactions between solid and liquid phases and between metals and gases, diffusion in molten alloys. Micrographs, graph. 8 ref. (K general, N1, N12)

736-K. (German.) **Welding With Low Heat Consumption.** G. M. Blanc. *Zeitschrift für Schweisstechnik*, v. 44, no. 10, Oct. 1954, p. 217-220.

Techniques and advantages of low-temperature gas and electric welding based on the alloying of the base metal with the weld-rod metal by diffusion. Micrographs, graph, photographs. (K2, K1)

737-K. (German and French.) **Technology of Protective-Gas Welding With Consumable Electrode (Sigma Welding).** Hans Schwarz. *Zeitschrift für Schweisstechnik*, v. 44, no. 10, Oct. 1954, p. 199-212.

Use of inert gases for welding aluminum and its alloys, copper and its alloys and stainless and carbon steels. Economy of the process. Photographs, graphs, diagram. 4 ref. (K1, Al, Cu, SS, Cn)

738-K. (Spanish.) **Theory and Applications of Fusionless Welding.** Alfred Dufner. *Ciencia y técnica de la Soldadura*, v. 4, no. 19, July-Aug. 1954, 4 p.

Principles of oxy-acetylene and electric-arc brazing. Micrographs, drawings. (K8)

739-K. (Book.) **Adhesive Bonding of Metals.** George Epstein. 218 p. Reinhold Publishing Corp., 330 W. 42nd St., New York 36, N. Y. $2.95.

Basic materials for adhesives; formulation; special high-temperature adhesives; design and testing; bonding techniques; sandwich constructions. (K12)

740-K. (Book.) **Basic Electricity.** G. K. Willecke. 96 p. 1954. Miller Electric Mfg. Co., Inc., Postoffice Box 798, Appleton, Wis. $1.00.

A collection of informal lectures on electrical fundamentals for arc welding operators. (K1)

741-K. (Book.) **Welding for Engineers.** Harry Udin, Edward R. Funk, and John Wulff. 430 p. 1954. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $7.50.

Cold, hot pressure, and resistance welding Permanent-electrode arc welding, consummable-electrode processes, and welding with chemical heat sources. Brazing and braze welding. Weld inspection and testing. (K general)

742-K. (Pamphlet.) **Resistance Welding Aluminum.** 21 p. 1954. Resistance Welder Manufacturers' Association, 1900 Arch St., Philadelphia 3, Pa. $0.20.

Preparation of aluminum and its alloys for welding; technical aspects of welding process. (K3, Al)

SECTION L

CLEANING, COATING and FINISHING

1-L. Radiant Burners Improve Galvanizing Quality, Cut Costs. R. M. Breckenridge and K. E. Rasmussen. *Iron Age,* v. 172, Nov. 5, 1953, p. 168-171.

Design and applications of novel burner which lengthens life of galvanizing pots and cuts operating costs. Diagrams, graphs, photographs. (L16)

2-L. A Bibliography of Publications on Industrial Protective Coatings. *Organic Finishings,* v. 14, Oct. 1953, p. 11-13, 16, 18-25.

An annotated list of material published in the U. S. since 1940 and currently in print. Divided into 24 sections. (L general)

3-L. Cleaning and Preparation of Metals for Electroplating. VII. Final Summary on Degreasing Evaluation Tests. Henry B. Linford and E. B. Saubestre. *Plating,* v. 40, Nov. 1953, p. 1269-1271.

New "atomizer test" for evaluating cleaners. Sensitivity of degreasing evaluation tests. Tables. 18 ref. (L12)

4-L. Applications of Barrel Enamelling. W. S. Field. *Product Finishing,* v. 6, Oct. 1953, p. 52-55.

Field of application and costs. Photographs. (L27)

5-L. Finishes for Soft Soldering. Clean Finishes. E. E. Halls. *Product Finishing,* v. 6, Oct. 1953, p. 66-76, 120.

Requirements and production methods. Tables. (L general, K7)

6-L. Recent Developments in Protective Coatings. Bright Plating Protection. *Product Finishing,* v. 6, Oct. 1953, p. 77-78.

Removal of rinse water and prevention of finger prints and discoloration. (L12)

7-L. Selection of Metal Cleaning Cycles. I. Samuel Spring. *Steel,* v. 133, Nov. 9, 1953, p. 112-114.

Final decision depends upon type of metal, soil, level of agitation, performance standards, water supply and cleaner. Tables, photographs. (To be continued.) (L10, L12, L13)

8-L. (German.) **Surface Layers of High Melting Titanium Compounds.** A. Münster and W. Ruppert. *Zeitschrift für Elektrochemie,* v. 57, no. 7, 1953, p. 564-571.

Methods of applying films of titanium nitride and titanium carbide on iron. Reaction mechanisms and macroscopic properties and microscopic structures of these films. Micrographs, graph. 13 ref. (L25, Ti, Fe)

9-L. Temperature Cycles of Enamelled Castings During the Process of Enamel Fusing. E. R. Evans. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Oct. 1953, p. 78-92 + 1 plate.

Temperature cycles determined by means of a thermocouple attached to a test casting in the furnace. Diagrams, graphs, photographs, tables. (L27, CI)

10-L. Magnesium to the Fore. *Chemical and Engineering News,* v. 31, Nov. 16, 1953, p. 4778, 4781.

Chemical surface treatments of magnesium for resisting corrosion and abrasion. Experiments using magnesium powder as fuel in internal combustion engines. (L14, T25, Mg)

11-L. Enamelling of Cast Iron. V. Montoro, E. Lossa, A. Guissani and E. Guissani. *Foundry Trade Journal,* v. 95, Nov. 5, 1953, p. 579-581.

Causes of enamel defects including slag and other inclusions, blow holes, rust, and gas evolution. (L27, CI)

12-L. Studies on the Electrodeposition of Brass From Non-Cyanide Bath. I. S. K. Ray and T. Banerjee. *Journal of Scientific & Industrial Research,*

v. 12, sec. A, Sept. 1953, p. 438-443.
Electrodeposition of brass from bath containing cupric tartrate and sodium zincate. Graphs, tables. 18 ref. (L17, Cu)

13-L. Flame-Plating Protects Parts From Wear. *Machine and Tool Blue Book,* v. 49, Nov. 1953, p. 209-210, 212-214.
Method of applying thin metallic coatings on metal parts and its applications. Photographs, diagrams, graph. (L23)

14-L. Barrel Finishing Processes for Small and Large Die Castings. T. P. Barbicane. *Machinery, (London),* v. 83, Oct. 30, 1953, p. 866-871.
Reviews tumbling operations, media for burnishing, methods of holding large components and local protection from abrasion. Photograph, diagrams. (L10, E13)

15-L. Properties of HAE Finish for Magnesium. R. G. Gillespie. *Materials & Methods,* v. 38, Nov. 1953, p. 104-105.
Electrolytically applied ceramic coating which has excellent corrosion, abrasion and heat resistance. Photographs. (L27, Mg)

16-L. Selecting Metal Cleaning Methods. *Materials & Methods,* v. 38, Nov. 1953, p. 119-134.
Basic features of the standard metal cleaning methods to aid in selecting method most feasible for a particular application. Tables. (L10, L12)

17-L. Chromium Plating Die-Cast Aluminum Engine Cylinders. Fred M. Burt. *Metal Finishing,* v. 51, Nov. 1953, p. 65-69.
Equipment, plant layout and operating procedures. Photographs, diagram. (L17, Al, Cr)

18-L. Growth of Parallel Grooves on Soluble Anodes by Electrolysis. Toshio B. Horiuchi. *Metal Finishing,* v. 51, Nov. 1953, p. 70-74.
Concludes that grooves are formed by bubbles which form at the lower part of the anode and ascend along the anode surface. Photographs, diagrams. (L17, Cu, Fe)

19-L. Electrodeposition of Copper From the Monoethanolamine Bath. T. L. Rama Char and N. B. Shivaraman. *Metal Finishing,* v. 51, Nov. 1953, p. 75-78.
Plating bath and experimental results. 17 ref. (L17, Cu)

20-L. Barrel Finishing of Metal Products. H. Leroy Beaver. *Products Finishing,* v. 18, Nov. 1953, p. 46-48, 50, 52, 54, 56.
Selection of a mineral for reducing surface area. Photograph. (L10, ST)

21-L. Burr Removal Expedited by Wet Tumbling. Harry C. Larson. *Products Finishing,* v. 18, Nov. 1953, p. 66-69.
Fast operation which meets requirements on a large variety of parts. Photographs. (L10)

22-L. Porcelain Enameling Steel Pipe. *Products Finishing,* v. 18, Nov. 1953, p. 69-70, 74.
Operation of dipping and drying machine. Photographs (L27, ST)

23-L. Protective Ceramic Coatings Versus the Corrosive Effects of Exhaust-Gas. Michael Lorant. *Refractories Journal,* v. 29, Oct. 1953, p. 418-420.
Tests of ceramic coatings on heat resistant alloys. Specimens were exposed to lead bromide vapors at temperatures of 1350 to 1650°F. (L27, SG-h)

24-L. (German.) **The Application of Polarographic Adsorption Analysis to the Investigation of Electrolytic Bright Baths.** J. Smelik. *Metalloberfläche,* Ausgabe B, v. 5, no. 11, Nov. 1953, p. 165-169.
Quantitative control of organic additions to bright baths. Theoretical basis and practical process are indicated. Tables, graphs. 8 ref. (L17)

25-L. (Polish.) **Electrolytic Polishing of Steel at Elevated Temperatures.** Z. Wojcik. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 3, 1953, p. 123-128.
Principles for the preparation of suitable electrolytes and technique. Graph, diagram, micrographs. 12 ref. (L13, ST)

26-L. (Russian.) **Study of Electrocrystallization of Metals in an Ultrasonic Field.** S. M. Kochergin and N. N. Terpilovskii. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 3, Mar. 1953, p. 394-398.
Mechanism of the effect of ultrasonic vibrations on electrodeposition was studied. Diagrams, graphs. 4 ref. (L17, Ni, Co, Sn, Cr)

27-L. Corrosion and Plant Maintenance. Joe Rench. *American Oil Chemists' Society, Journal,* v. 30, Nov. 1953, p. 571-574.
Components of paint and characteristics of each ingredient justifying its use. Application of paint in combating corrosion. (L26)

28-L. Some Properties of Tin-II Sulfate Solutions and Their Role in Electrodeposition of Tin. II. Solutions With Tin-II Sulfate and Sulfuric Acid Present. Clarence A. Discher. *Electrochemical Society, Journal,* v. 100, Nov. 1953, p. 480-484.
Measurement of density, refractive index, surface tension, viscosity,

freezing point depression, conductivity, transference number and electrode potential to pure tin and hydrogen. Relationships between concentration and the magnitude of these properties. Tables, graphs. 4 ref. (L17, SN)

29-L. Electroplating on Titanium. William H. Colner, Morris Feinleib and John N. Reding. *Electrochemical Society, Journal,* v. 100, Nov. 1953, p. 485-489.

Method for obtaining adherent electrodeposits which includes subjecting the titanium to anodic etch prior to plating. Graph, photographs. (L17, Ti)

30-L. An X-Ray Study of the Effect of Organic Compounds on the Crystal Growth of Nickel During Electrodeposition. Francis Denise and Henry Leidheiser, Jr. *Electrochemical Society, Journal,* v. 100, Nov. 1953, p. 490-495.

Effect on grain size and orientation. Reports that orientation other than (100) produced brittle deposits. Photographs, tables and graph. 7 ref. (L17, M26, Ni)

31-L. Correlation of Limiting Currents Under Free Convection Conditions. C. R. Wilke, M. Eisenberg and C. W. Tobias. *Electrochemical Society, Journal,* v. 100, Nov. 1953, p. 513-523.

Experimental studies of limiting rates of deposition of copper ions at a vertical cathode in an unstirred solution. Diagram, photographs, tables, graphs. 23 ref. (L17, Cu)

32-L. Theory and Practice of Chemical Polishing. II. Processes for Light Alloys, Iron Group and Other Metals. R. Pinner. *Electroplating and Metal Finishing,* v. 6, Nov. 1953, p. 401-410.

The applications of chemical polishing to metallography and in machining. Typical polishing costs. Tables, graphs. 41 ref.
(L13, M21, G17, EG-a, ST, Zn, Cd)

33-L. Some Observations on the Electrodeposition of Tin-Zinc Alloys. Bernard C. Lewsey. *Electroplating and Metal Finishing,* v. 6, Nov. 1953, p. 411-413.

Equipment and procedures. Tables. (L17, Sn, Zn)

34-L. The B.N.F. Jet Test on Organic Bright Nickel Deposits. *Electroplating and Metal Finishing,* v. 6, Nov. 1953, p. 417-418.

Variations in the rate of penetration of coatings during thickness measurement. Graph. 3 ref.
(L17, Ni)

35-L. Porosity of Sprayed Coatings. D. de Paauw. *Electroplating and Metal Finishing,* v. 6; *Metal Spraying,* v. 3, Nov. 1953, p. 435-436, 438.

Origin and effect of porosity in sprayed metal coatings, its measurement and effect of operating variables. Tables. (To be continued.) (L23)

36-L. Finishing of New Republic Steel Kitchens. *Industrial Heating,* v. 20, Nov. 1953, p. 2255-2256, 2258-2260, 2262, 2264, 2268, 2270.

Production of a new improved line of steel kitchen cabinet and sink equipment has recently begun at Berger Mfg. Div., Republic Steel Corp., Canton, Ohio. Photographs. (L27)

37-L. Finishing by Tumbling. J. Lomas. *Machinery Lloyd (Overseas Ed.),* v. 25, Nov. 1953, p. 85-87.

Tumbling applications, equipment and operating procedures. (L10)

38-L. Electroplating Prior to Hot Galvanizing for Improved Results. Allen T. Baldwin. *Metal Progress,* v. 64, Dec., 1953, p. 76-81.

Specimens of A.I.S.I. 1010 steel with thin precoats of zinc, tin, nickel and iron compared with specimens galvanized with no precoat. Early indications show the process may be economical if more efficient heating methods are adopted. Microphotographs.
(L17, L16, CN, Zn, Sn, Ni, Fe)

39-L. Diffusion Coatings. *Metal Progress,* v. 64, Dec. 1953, p. 122, 124.

Digest of "Diffusion Coatings", D. M. Dovey, I. Jenkins and K. C. Randle, *Journal of the Institute of Metals, Symposium on Properties of Metals,* 1952, p. 213-236. Principles and practices of applying metallic or ceramic coatings for protection and to save critical materials. (L15)

40-L. Reflectivity of Aluminum Pigments and Paint. II. F. B. Rethwisch, G. M. Babcock and E. C. Riggs. *Paint, Oil, & Chemical Review,* v. 116, Nov. 19, 1953, p. 22, 24.

Results of experimental studies on pigments, from coarsest to finest, in paste and powder form. Results are a function of vehicle characteristics, pigment concentration and spraying technique. Tables.
(L26, Al)

41-L. A Metallographic Study of Some Steels Used for Nickel Plating. A. E. R. Westman and F. A. Mohrnheim. *Plating,* v. 40, Dec. 1953, p. 1366-1372; disc., p. 1373-1375.

Study to find what range of steels was being used in electroplating; perfect current techniques for studying the zone of contact between the basis metal and the electroplate;

and to determine some plating failures in which the basis metal might be at fault. Diagrams, photographs. 9 ref. (L17)

42-L. **The Analysis of Electroplating Solutions for Major Constituents.** Earl J. Serfass. *Plating,* v. 40, Dec. 1953, p. 1385-1389; disc., p. 1389-1390.

Analyzes available methods for determination of macroconstituents in chromium, silver, nickel and brass plating baths. Tables, diagrams. (L17, M28, Cr, Ag, Ni)

43-L. **Effect of Impurities and Purification of Electroplating Solutions. I. Nickel Solutions.** D. T. Ewing. *Plating,* v. 40, Dec. 1953, p. 1391-1400; disc., p. 1400.

Effects of hexavalent and trivalent Cu on the appearance, adhesion, ductility, salt-spray (fog) corrosion resistance, hardness and throwing power of nickel deposits. Graphs, tables. 12 ref. (L17, Ni, Cu)

44-L. **The Analyst's Function in the Electroplating Industry.** K. E. Langford. *Product Finishing,* v. 6, Nov. 1953, p. 48-55.

Attempts to cover new ground by discussing function of the analytical chemist as an individual within the framework of the electroplating industry. Photographs. (L17, S11)

45-L. **Metallizing Non-Metallic Surfaces.** *Product Finishing,* v. 6, Nov. 1953, p. 74-78, 110.

Reviews five main methods at present available for use with ceramics, glass and plastics. Tables. (L23)

46-L. **Review of Electroplating Plant. I.** *Product Finishing,* v. 6, Nov. 1953, p. 79-88.

Representative selection of generators, rectifiers, plating vats and plating barrels. Photographs. (L17)

47-L. **Selection of Metal Cleaning Cycles.** Samuel Spring. *Steel,* v. 133, Nov. 16, 1953, p. 112-114.

Importance of water in terms of hardness and rinsability. Other factors to be considered in selection of cleaner. Photographs, table. (L12)

48-L. (German.) **Studies on the Anodic Behavior of Nickel. II.** G. Trümpler and W. Saxer. *Helvetica Chimica Acta,* v. 36, no. 6, 1953, p. 1630-1639.

Comparative experiments on two electrodes of high and highest purity nickel with special consideration of the course of passivation in dependence upon the "critical" potential. Tables, graphs. 14 ref. (L17, Ni)

49-L. (German.) **Plant Experiences With Pot-Galvanizing Installations for Wire.** Jürgen-Echter Becker. *Stahl und Eisen,* v. 73, no. 22, Oct. 22, 1953, p. 1385-1391.

Functions, operations and results of hot galvanizing wire plant devices. Photographs, diagrams. 6 ref. (L16, ST, Zn)

50-L. (German.) **Phosphatizing Steel Wire in Wire Mills.** Hans Berkenhoff. *Stahl und Eisen,* v. 73, no. 22, Oct. 22, 1953, p. 1391-1394.

Experiences in bonderizing wire. Industrial procedure and prospects for use in the wire manufacturing industry. 11 ref. (L14, ST)

51-L. (Russian.) **Problems of Bright Tinning.** G. I. Chufarov, M. G. Zhuravleva, E. P. Tatievskaia, B. D. Averbukh and V. K. Antonov. *Zhurnal Prikladnoi Khimii,* v. 26, no. 6, June 1953, p. 652-655.

Boiling point of flux is an important characteristic which varies with the water content. Tables, graphs. (L16, Zn, Sn)

52-L. (Book.) **The Filtration and Pumping of Plating Solutions.** G. T. Colegate. 56 p. 1953. Electroplating and Metal Finishing, 83-85 Udney Park Road, Teddington, Middlesex, England. 7/6d.

Deals comprehensively with the various types of filters and pumps in use for plating solutions. (L17)

53-L. (Book.) **Finishing Handbook and Directory.** 512 p. 1953. Sawell Publications Ltd., 4 Ludgate Circus, London, E. C. 4, England. 21s-0d.

New and revised sections on vacuum deposition, vitreous enamel, marking, and transfer processes. (L general)

54-L. (Book—German.) **(Practical Electrochemistry) Praktische Elektrochemie.** V. Gaertner. 512 p. 1952. Verlag für Jugend und Volk, Vienna. $11.90.

Includes recent developments in electroplating. (L17, C23)

55-L. **The Anodizing of Zirconium and Other Transition Metals in Nitric Acid.** R. D. Misch and W. E. Ruther. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 531-537.

At 1 ma. per sq. cm. and concentrations of nitric acid exceeding 14% by weight, zirconium was found to develop a low-resistance oxide layer. Titanium, hafnium, columbium, tantalum and tungsten showed a high resistance at this current even in 70% acid. Graphs, tables, diagram. 20 ref. (L19, Zr, Ti, Hf, Cb, Ta, W)

56-L. **The Interaction of Organic Compounds With the Surface During the Electrodeposition of Nickel.** Clayton C. Roth and Henry Leidheiser,

Jr. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 553-565.

Measurements of cathode potential were made during electrodeposition of nickel in presence of 76 organic compounds. Ability of the compound to make the cathode potential more negative at a fixed current density was dependent upon acidic or basic character of the compound, size of the molecule, and number of available pairs of electrons. Graphs, tables. 4 ref. (L17, Ni)

57-L. Electric Hot-Galvanizing Bath. *Engineering,* v. 176, Nov. 13, 1953, p. 638.

Equipment and its operation. (L16, Zn)

58-L. Studies in the Electrodeposition of Cobalt From Fluoborate Bath. D. M. Fegredo and J. Balachandra. *Indian Institute of Science, Journal,* v. 35, Sec. B, Oct. 1953, p. 191-201.

Optimum conditions for electrodeposition of cobalt determined from a study of the effect of different variables on plating characteristics of cobalt fluoborate solution. Tables, graphs. 8 ref. (L17, Co)

59-L. Electrodeposition of Copper From the Diethanolamine Bath. N. B. Shivaraman and T. L. Rama Char. *Indian Institute of Science, Journal,* v. 35, Sec. A, Oct. 1953, p. 293-297.

Bath composition and procedure for plating steel. Tables. 7 ref. (L17, Cu, ST)

60-L. Electrodeposition of Silver From the Iodide Bath. T. L. Rama Char and R. Sadagopachari. *Indian Institute of Science, Journal,* v. 35, Sec. A, Oct. 1953, p. 298-306.

Silver was electrodeposited on copper from a complex iodide solution. Tables. 11 ref. (L17, Ag, Cu)

61-L. Abrasion Resistant Coatings Sprayed on Metal Surfaces. W. G. Patton. *Iron Age,* v. 172, Dec. 3, 1953, p. 172-173.

Surface preparation and spraying operations in application of nickel-base alloy to pump plungers. Photographs. (L23, Ni, CN)

62-L. Intricate Procedures Solve Tough Hard-Facing Problems. J. Wischhusen. *Iron Age,* v. 172, Dec. 10, 1953, p. 164-167.

Rebuilding worn areas along flight edge of an extrusion screw and hard facing a cage wall in a steam valve. Photographs. (L24)

63-L. Vitreous-Enamelled Aluminium Stock. C. R. Sigler. *Light Metals,* v. 16, Nov. 1953, p. 358-360.

Pickling, spraying, firing and inspection. Photographs. (To be concluded.) (L27, Al)

64-L. Chemical and Anodic Treatments. *Light Metals,* v. 16, Nov. 1953, p. 377.

Analysis of German patents on anodizing. Photograph. (L14, L19)

65-L. The Diffubrite Chromium Diffusion Process. *Machinery,* v. 83, Nov. 6, 1953, p. 891-897.

Method of treatment and applications of the process. Photographs, tables, micrographs. (L15, Cr, ST)

66-L. Ultrasonic Cleaning. *Machinery,* v. 83, Nov. 20, 1953, p. 1000.

Cleaning apparatus. Photographs. (L10)

67-L. A Statistical Quality Control Approach to the Control of Plating Solutions. Allan D. Woodell. *Metal Finishing,* v. 51, Dec. 1953, p. 54-58.

Technique as a system of inspection, analysis and action. Photograph, charts. (L17, S12)

68-L. Vacuum Metallizing and Plating—A Comparison. Isidore Cross. *Metal Finishing,* v. 51, Dec. 1953, p. 59-63, 78.

Compares vacuum evaporation with electroplating. Limitations, advantages and applications of each. Photographs. (L25, L17)

69-L. Metal Cleaning of Fine Instrument Components. Edward A. Hedman and Arnold Miller. *Metal Finishing,* v. 51, Dec. 1953, p. 66-68.

Role of contaminants in deterioration of fine instruments. Experimental studies leading to development of suitable cleaner. 4 ref. (L12)

70-L. Electroplating in Israel. Marvin Rubinstein. *Metal Finishing,* v. 51, Dec. 1953, p. 69-73, 78.

Characteristics of finishing, cleaning procedures, plating solutions, quality control, polishing materials and equipment utilized. Photographs. (L17)

71-L. Inhibitors for Metal Finishing. R. O. Bailey. *Metal Industry,* v. 83, Nov. 20, 1953, p. 421-422.

Properties and effects of inhibitors used in acid solutions for pickling steel and ferrous alloys. (L12, ST)

72-L. Running a Production Test of Metal Cleaning Abrasives. *Metal-Working,* v. 9, Dec. 1953, p. 18-19.

Steps in determining over-all efficiency of abrasives. Graphs, tables. (L10)

73-L. Vacuum Metallizing of Plastic Sheet. G. H. Bancroft. *Modern Plastics,* v. 31, Dec. 1953, p. 122-123, 210.

Equipment and operating procedures for coating acetate and styrene sheet with aluminum. Photograph. (L25, Al)

74-L. Adapting Spraying Methods to Various Finishes and Operations. H. Preuss. *Organic Finishing,* v. 14, Nov. 1953, p. 20-25, 29.

Standard spray gun parts can be varied to accomplish specific purposes. Special types of guns developed for unusual applications. Photographs. (L23)

75-L. Phosphatizing Steel Surfaces. John E. Trumbour. *Organic Finishing,* v. 14, Nov. 1953, p. 26-29.

Uses of phosphate coatings to improve paint bonding and prevent corrosion and methods of applying and evaluating coatings. Photographs. (L14)

76-L. Automotive Production Finishing. VII. The Changing Aspects of Automotive Finishes and Their Testing. Rick Mansell. *Organic Finishing,* v. 14, Nov. 1953, p. 30-33.

Recent changes in composition, application techniques and testing. Photographs. (L general)

77-L. The Origin of Stress in Metal Layers Condensed From the Vapour in High Vacuum. H. P. Murbach and H. Wilman. *Physical Society, Proceedings,* v. 66, no. 407 B, Nov. 1953, p. 905-910.

Measurements of stress in deposits of Ni, Fe, Pb, Au, Cu, Ag, Sb, Al, Bi, Mg and Zn on copper strips. Stress found to be characteristically of a tensile nature and amount of stress is different for different metals. Diagram, tables.
(L25, Q25, Ni, Fe, Ph, Au, Cu, Ag, Sb, Al, Bi, Mg, Zn)

78-L. Reflectivity of Thin Aluminium Films and Their Use in Interferometry. J. C. Burridge, H. Kuhn and Anne Pery. *Physical Society, Proceedings,* v. 66, no. 407 B, Nov. 1953, p. 963-968.

Coefficients of transmission and reflection of thin aluminum films deposited on silica by vacuum evaporation were measured for wavelengths between 4200 and 2600 Å. Graphs. 4 ref. (L25, T8, P17, Al)

79-L. Plan Protective Painting to Reduce Electrolytic Corrosion. L. G. Jones. *Power Engineering,* v. 57, Dec. 1953, p. 82-83.

Electrolytic corrosion of metals and protection by anodic coatings on paints. Photograph, table. 5 ref. (L19, R1)

80-L. Barrel Finishing. J. G. Reed. *Screw Machine Engineering,* v. 15, Dec. 1953, p. 53-56.

Advantages and operating procedures. Photographs, table. (L10)

81-L. Plated Coatings. Designers Weigh Tin Alloys. Frederick A. Lowenheim. *Steel,* v. 133, Nov. 30, 1953, p. 110-112.

Present ample tin supply leads to closer examination of its potential as an alloying constituent. Success is seen with lead, zinc, nickel, copper and cadmium. Photographs, tables. 8 ref.
(L17, Cd, Cu, Ni, Pb, Sn, Zn)

82-L. Instrumentation for Surface Finishing of Jet Engine Parts. R. J. Thomas. *Steel Processing,* v. 39, Nov. 1953, p. 591-593.

Automatic control equipment in finishing operations. Photographs. (L24, S18)

83-L. (French.) **Electrolytic Polishing of Germanium and Platinum in the Presence of F- or Cl-Ions.** Philippe Brouillet and Israel Epelboin. *Comptes rendus,* v. 237, no. 16, Oct. 19, 1953, p. 895-897.

Reports on experiments using a mixture of NaCl-KCl, melting at 661° C. and the eutectic FNa-FK (699° C.), and a platinum electrode. Results are discussed. 5 ref.
(L13, Ge, Pt)

84-L. (French.) **Diffusion of Metallic Ions Through Electrodeposited Metals.** Helmi Makram. *Comptes rendus,* v. 237, no. 18, Nov. 12, 1953, p. 1086-1088.

Variation of passage of copper ions through chromium plating as a function of chromium bath composition. Graphs. (L17, N1, Cu, Cr)

85-L. (French.) **Determination of the Reflection, Transmission, and Adsorption Factors of Thin Vapor-Deposited Gold Layers.** P. Rouard, D. Malé and J. Trompette. *Journal de physique et le radium,* v. 14, no. 11, Nov. 1953, p. 587-590.

Investigations on layers deposited on glass. Experimental details. Tables. 6 ref. (L25, P17, Au)

86-L. (French.) **Hot Tinning.** G. Haas. *Métallurgie et la construction mecanique,* v. 85, no. 11, Nov. 1953, p. 895.

Finishing operations and drying equipment. (L16)

87-L. (German.) **Aluminum for Decorative Uses.** D. Lenz. *Aluminium,* v. 29, no. 11, Nov. 1953, p. 451-461.

Mechanical rough polishing and degreasing; electrolytical glazing; and chemical polishing. Graphs, tables, photographs, micrographs. 21 ref. (L10, L12, L13, Al)

88-L. (German.) **The Anodic Treatment of Strips and Wires.** E. Herrmann. *Aluminium,* v. 29, no. 11, Nov. 1953, p. 465-472.

Stagnant anodic treatment, induction of electric power, prevention of overheating and cooling. Diagrams. 34 ref. (L19, Al)

89-L. (German.) **Electric Deposition Welding of Rails. II.** Franz Novotny. *Schweisstechnik,* v. 7, no. 10, Oct. 1953, p. 113-117.

Repair of worn parts of streetcar rails by electric deposition welding with different types of electrodes. Photographs. (L24)

90-L. (Russian.) **Certain Peculiarities of Polishing of Chromium-Plated Parts.** N. A. Kamenev and A. A. Mikhailov. *Stanki i Instrument,* v. 14, no. 7, July 1953, p. 20-23.

Wear resistance depends on nature of mechanical processing. Tables, graphs. (L10, Cr)

91-L. (Russian.) **Heat Resistance During Surface Alloying of Steel With Other Metals.** G. N. Dubinin. *Vestnik Mashinostroeniia,* v. 33, no. 8, Aug. 1953, p. 74-79.

Results show that chromized iron and steel displayed the best heat resistance. Tables, graphs. 23 ref. (L14, R2, Cr, Fe, ST)

92-L. The Anodic Oxidation of Metals at Very Low Current Density. II. Nickel. III. Copper. S. E. S. El Wakkad and Sayeda H. Emara. *Chemical Society, Journal,* 1953, Nov., p. 3504-3512.

Studies in solutions of different pH values. Potential measurements made. Graphs, tables. (L19, Ni, Cu)

93-L. Vitreous Enamelling in Sweden, Denmark and Finland. J. H. Gray. *Foundry Trade Journal,* v. 95, Dec. 3, 1953, p. 679-686.

Enameling industry as it exists today. Photographs, tables. (To be concluded.) (L27, CN, CI)

94-L. Factors Affecting the Selection of a Finish for Gas-Fired Space Heating Equipment. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 248-253.

Compares vitreous enamels with other types of finishes for radiant heaters. Photographs. (L27)

95-L. Tin Printing on the Grand Scale. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 254-258.

Facilities of tin-printing plant. Photographs. (L26, Sn)

96-L. Chemical Treatment of Ships' Hulls. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 260-262.

Tests of "Foscote R. S." coating designed for use on rusted steel. Photographs, table. (L12)

97-L. Filling Leads to Fine Finishes. J. H. Ousbey. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 266, 268-280.

Fillers and their application to cast iron. Diagram. (L general, CI)

98-L. Electrolytic-Tinplate Instrumentation. William P. Smith. *Instruments,* v. 26, Dec. 1953, p. 1875, 1905-1906.

Each step on the electrolytic-tinplate production process uses instrumentation. Work remains to be done at several key points in the process. (L17, S18, Sn)

99-L. Selecting Ceramic Coatings for Jet Engine Parts. W. C. Rous, Jr. *Materials & Methods,* v. 38, Dec. 1953, p. 116-119.

Purposes and characteristics of ceramic coatings. Types, tests and processes. Tables, photographs. (L27)

100-L. Hard Chrome Plating Made Easy. Ezra A. Blount. *Product Finishing,* v. 18, Dec. 1953, p. 24-34, 36.

Chromium plating of dies for the plastic molding industry, gages, tools and parts for special applications. Photographs, table. 4 ref. (L17, Cr)

101-L. Stretcher-Strain Markings in Aluminium Alloys and Methods for Their Elimination. V. A. Phillips. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1048-1054.

Includes tables, photographs. 9 ref. (L10, L12, Mg, Al)

102-L. Surface Treatment and Finishing of Light Metals. VIII. S. Wernick and R. Pinner. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1055-1061.

Includes photographs, table. 31 ref. (To be continued.) (L general, Al)

103-L. Design for Longer Pickling Equipment Life. J. F. Revilock. *Steel,* v. 133, Dec. 21, 1953, p. 84, 86, 88.

Applications of carbon and graphite in wet and dry pickling equipment. Design tips and performance data. Diagrams. (L12)

104-L. Bronze Plating Solves Design and Corrosion Problems. W. H. Safranek, W. J. Neill and D. E. Seelbach. *Steel,* v. 133, Dec. 21, 1953, p. 102-104, 106, 109.

Bronze plating process, its advantages and applications. Photographs, micrographs. 6 ref. (L17, Cu)

105-L. Mechanical Descaling of Wire Rods Improves Coating. *Steel,* v. 133, Dec. 21, 1953, p. 114, 116-117.

Descaling, drawing compounds and diamonds used in drawing dies. Photograph. (L10, F28, CN)

106-L. (French.) **Action of Ultrasounds During Anodic Oxidation.** Jean-Jacques Trillat. *Comptes rendus,* v. 237, no. 19, Nov. 9, 1953, p. 1147-1148.

By causing an aluminum leaf to vibrate at ultrasonic frequencies and at the same time subjecting it to anodic oxidation, it was noted that structure and properties of the layer of alumina formed are very dif-

ferent from those obtained in absence of ultrasounds. Diagram. (L19, Al)

107-L. (French.) **Experimental Study of the Poisoning of a Platinum-Platinum Electrode.** Maurice Bonnemay. *Comptes rendus,* v. 237, no. 20, Nov. 16, 1953, p. 1235-1237.

Study of hydrogen overvoltage curve relative to platinum-platinum electrodes poisoned by micro deposits of lead or zinc. Graphs. (L17, Pb, Zn)

108-L. (Polish.) **Anticorrosive Hard Rubber Coatings.** Z. Macek. *Przemysl Chemiczny,* v. 9, no. 8, Aug. 1953, p. 426-428.

Coating of chemical equipment. Compares behavior of various compounds. Tables, photographs. (L26)

109-L. (Russian.) **Mechanism of the Process of Electropolishing Copper in Phosphoric Acid.** A. V. Fortunatov and A. V. Finkel'shtein. *Doklady Akademii Nauk SSSR,* v. 90, no. 5, June 11, 1953, p. 823-826.

Representation of mechanism and kinetic equations developed which conform well with experimentation. Graphs, tables. 5 ref. (L13, Cu)

110-L. (Russian.) **Influence of Oxide Coatings on Deformation of Aluminum in Inactive and Active Mediums.** L. A. Kochanova and B. Ia. Iampol'skii. *Doklady Akademii Nauk SSSR,* v. 92, no. 1, Sept. 1, 1953, p. 119-122.

Tests on polycrystalline pure aluminum wire. Table, graphs. 10 ref. (L14, Al)

111-L. How to Make Steel Last Three Times as Long. Fred B. Shaw. *American Machinist,* v. 97, Dec. 21, 1953, p. 97-99.

Ceramic coatings help protect against "hot spots" when metals are exposed to high temperatures and produce a surface smoothness that has minimum resistance to flow of hot gases. Photographs. (L27)

112-L. Flame Spraying Ceramics. Thomas A. Dickinson. *Ceramic Age,* v. 62, sec. 1, Dec. 1953, p. 15-16.

Process for coating metals with refractory materials. Photographs, diagram. (L27)

113-L. Theory of Adherence of Enamel on Iron. A. Dietzel. *Ceramic Age,* v. 62, sec. 1, Dec. 1953, p. 17, 20, 21, 24, 38, 39. (Translated from *Sprechsaal* v. 78, no. 5, 1945, p. 12.)

Formation of iron oxide interface, formation of dendrites, theory of gripping and electrochemical theory. Tables. 22 ref. (L27, Fe)

114-L. Finishing With Polyesters. Frank Charity. *Consulting Engineer,* v. 2, Dec. 1953, p. 26-29.

Resin classifications, forms available, outstanding properties, application methods and typical uses. Photographs, table. (L26)

115-L. Theory of Electrolytic Polishing. A Review. R. Pinner. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 444-450.

Graphs, diagram. 29 ref. (L13)

116-L. Finishes Alternative to Conventional Nickel-Chromium. J. Chadwick. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 451-455.

Corrosion resistance of various substitutes for normal nickel-chromium plating were investigated in marine, industrial and indoor exposures over 2½ years. A high-temperature chromium plating technique is described which gives corrosion resistance almost three times that of normal deposits. Graph, tables. 4 ref. (L17, R3, Ni, Cr)

117-L. A Simple Costing System for General Plating Shops. Fredk. C. Pond. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 457-458.

Records and procedures. (L general, A6)

118-L. Preparation of Copper and Copper-Base Alloys for Electroplating. *Electroplating and Metal Finishing,* v. 6, Dec. 1953, p. 459-460.

Summarizes ASTM tentative recommended practice B281-53T. (L17)

119-L. Production of Radio Circuits by Metal Spraying. *Electroplating and Metal Finishing,* v. 6; *Metal Spraying,* v. 3, Dec. 1953, p. 472-473.

Procedures and equipment. Diagrams. 4 ref. (L23)

120-L. Porosity of Sprayed Coatings. II. Mechanical Treatments and Lubrication. D. de Paauw. *Electroplating and Metal Finishing,* v. 6; *Metal Spraying,* v. 3, Dec. 1953, p. 475-476.

Effect of mechanical treatments such as grinding and polishing and function of porosity in use of metal-sprayed bearing parts. Graph, tables. (To be concluded.) (L23, G18, L10)

121-L. Spray Equipment. William Beacham. *Industrial Finishing,* v. 30, Dec. 1953, p. 26-28, 30, 32.

Spray guns, circulating paint systems, hose, hose connections and spray booths. Photographs. (L26)

122-L. From Hot Spray to Airless Spray. James A. Bede. *Industrial Finishing,* v. 30, Dec. 1953, p. 40, 42, 44, 46.

Role of paint heaters in hot-spray painting. Development and advantages of airless spray process. Photographs. (L26)

123-L. Titanium Descaled Successfully With Sodium Hydride. Marshall Sittig. *Iron Age,* v. 172, Dec. 17, 1953, p. 137-139.

Even in sheets as thin as 0.015 in., bath works successfully without burn-through if temperatures are carefully controlled. Photographs, diagrams. (L12, Ti)

124-L. Plating Tin on Aluminium. J. M. Bryan. *Metal Industry,* v. 83, Dec. 4, 1953, p. 461-463.

Results of studies undertaken to ascertain whether a satisfactory deposit of tin could be formed by simple chemical displacement which would serve either by itself as a surface finish for aluminum or as a base for soldering and electroplating. Table. 14 ref. (To be concluded.) (L15, Sn, Al)

125-L. How to Finish Magnesium. Hugo A. Barbian. *Modern Metals,* v. 9, Dec. 1953, p. 66-68, 70-71.

Finishing requirements, experience with presently available finishes and prospects for development of improved finishes in the future. Diagrams, tables. (L general, Mg)

126-L. Solubility Factor in Metal Phosphate Pre-Treatments. Max Kronstein, Philip Hixon and Jack Granowitz. *Paint and Varnish Production,* v. 43, Dec. 1953, p. 19-30.

Study of metal-phosphate coatings on steel as a base for paint application. Graphs, tables, photographs, diagram. 4 ref. (L14)

127-L. Paint Technology and the Law. I. M. H. M. Arnold. *Paint Manufacture,* v. 23, Dec. 1953, p. 400-401.

Broad aspects of English laws regulating use of lead paints, cellulose solutions and inflammable liquids. (L26)

128-L. Clad Metals and Clad Metal Processing. Walter L. Keene. *Steel Processing,* v. 39, Dec. 1953, p. 647-653.

Methods of cladding, including pressing, casting, direct rolling, sintering and deposition. Diagrams, photographs, micrographs. (L22)

129-L. Phosphate Coating as a Pre-Paint. Carl S. Rankin. *Western Machinery and Steel World,* v. 44, Dec. 1953, p. 98-100.

Treating metal surfaces with a phosphate coating, prior to painting, assures a good clean bond between the surface and paint. Phosphating also reduces chemical reaction when protectiveness of paint is removed. Micrographs, photograph. (L14, L26)

130-L. A New Style De-Scaling Machine. *Wire and Wire Products,* v. 28, Dec. 1953, p. 1315-1316.

(Translated and abridged from *Draht,* March 1953.) Description of equipment and operating characteristics. Photographs. (L10)

131-L. (Hungarian.) **Modern Cleaning of Castings.** György Szvath. *Ontöde,* v. 4, no. 9, Sept., p. 202-204.

Modern processes and machinery with special emphasis on elimination of dust and proper airing of the shop. (To be continued.) (L10, A5, E general)

132-L. A Simple Reproducible Method for Determining Metal Cleaning Efficiency. Arnold Miller and Edward A. Hedman. *ASTM Bulletin,* 1953, no. 194, p. 51-52.

Simple test procedure for screening metal cleaners, which can be used for determining optimum cleaning cycles for horological components. Photographs. (L10, L12)

133-L. Corn Product Controls Corrosion With Asphaltic Coating. *Chemical Processing,* v. 17, Jan. 1954, p. 72-79.

Coating of steel structures and surfaces of equipment. Coating affords protection from effects of highly corrosive, moist salt air and provides excellent insulation when impregnated with cork. Photographs. (L26, R3)

134-L. Porcelain Enamels and Ceramic Coatings, Prime Inhibitors of Metal Corrosion. Dwight G. Bennett. *Corrosion,* v. 10, Jan. 1954, p. 13-20; disc., p. 20.

Presents and evaluates test methods. Examples of coating effectiveness and areas in which coatings could be used to advantage. Photographs, tables, graphs. (L27)

135-L. Finishes for Communications Equipment With Special Reference to Electroplate Coatings. E. C. J. Marsh. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 69-88 + 8 plates.

Treatment of subject in general, intentionally avoiding technical details as far as possible. Tables. (L17, Zn, Cd, Ni, Cr, Al, Sn)

136-L. Some Factors in Spray-Silvering. P. B. G. Upton, G. W. Soundy and G. E. Busby. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 103-113 + 1 plate.

Particular process developed for use in electrotyping and employing a solution of formaldehyde for reduction of silver ammonio-nitrate solution. Essentials of present method. Tables, graphs. 9 ref. (L23)

137-L. The Physical and Chemical Changes Which Accompany the Polishing of Metals. A. J. W. Moore.

Electrodepositors' Technical Society, Journal, v. 28, 1951-1952, p. 117-124; p. 125-131 + 6 plates.

Illustrates relationship between phenomena of friction and properties of a polished surface. 21 ref. (L10)

138-L. An Experimental Study of Electropolishing. J. Edwards. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 133-148; disc., p. 149-154 + 2 plates.

Experimental study of smoothing efficiencies in electropolishing. Work is part of a full investigation of mechanism of electropolishing which is to be published elsewhere. Graphs, diagrams. 8 ref. (L13)

139-L. The Properties of Metallic Coatings Produced by Evaporation and Sputtering. S. Tolańsky. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 155-165.

Similarity of metal films produced by cathodic sputtering and by thermal evaporation. Diagrams, graph, photograph. (L25)

140-L. Practical Considerations in the Application of Vacuum Coating for Metal Finishing. L. Holland. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 167-178; disc., p. 187-193 + 4 plates.

Includes diagrams, graph. 8 ref. (L25)

141-L. Lacquering to Obtain Brilliance and Metallic Lustre. H. H. Vevers and G. E. Gardam. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 179-186; disc., p. 187-193.

Types of lacquer used for base and top coats and methods of application and stoving. Graph, diagram. (L26)

142-L. The Electrodeposition of Tin-Antimony Alloys From Chloride-Fluoride Electrolytes. J. W. Cuthberton and N. Parkinson. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 195-201.

Alloys of tin and antimony containing up to about 45% antimony can be satisfactorily deposited from solutions containing chlorides of the two metals, a fluoride and an addition agent. Graphs, tables. 5 ref. (L17, Sb, Sn)

143-L The Plating of Aluminium Articles as a Production Process. A. W. Wallbank. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 209-218; disc., p. 218-227.

Aluminum as a basis metal, problems and methods of plating and the history of the electrolytic (Vogt) process. Tables. 11 ref. (L17)

144-L. Vitreous Enamelling in Sweden, Denmark and Finland. J. H. Gray. *Foundry Trade Journal,* v. 95, Dec. 10, 1953, p. 725-728, disc., p. 728-729.

Equipment and techniques employed. Photographs. (L27)

145-L. Versatile Setups Finish Diecastings Faster. Frank E. Beers. *Iron Age,* v. 172, Dec. 24, 1953, p. 73-75.

Economy and efficiency result from close supervision and quality control. Photographs. (L general, S12, Zn)

146-L. New Corrosion Resistant Coating Protects Cast Iron Coolers. J. J. Obrzut. *Iron Age,* v. 172, Dec. 24, 1953, p. 76-77.

Cooling and condensing sections are being protected with a special aluminum coating. Coating is a mixture of aluminum powder in a special plastic vehicle. Photographs. (L26, Al, CI)

147-L. New Plating Process Deposits Nickel Brighter, Faster. C. G. Rising. *Iron Age,* v. 172, Dec. 24, 1953, p. 78-81.

Features built into process overcome shortcomings previously experienced and provide easy-to-control bath. Operating ranges for temperature and current density are broad. (L17)

148-L. Hard Surfacing. Coated Diesel Engine Valves Outlast Originals. *Iron Age,* v. 172, Dec. 24, 1953, p. 88.

Includes photographs. (L24)

149-L. The Protection of Iron and Steel by Metallic and Non-Metallic Coatings. II. J. C. Hudson and J. F. Stanners. *Iron and Steel Institute, Journal,* v. 175, Dec. 1953, p. 381-390 + 6 plates.

Second report on a series of tests on protection of structural steel by metallic coatings and by nonmetallic coatings other than oil paints. Graphs, tables, photograph. 6 ref. (L general)

150-L. The Production of Fine Wires by Electrolytic Polishing. H. R. Haines and B. W. Mott. *Journal of Scientific Instruments,* v. 30, Dec. 1953, p. 459-460.

Simple apparatus for reducing diameter of brittle or easily oxidized metal wires by an electrolytic polishing method. Diagram, table. 3 ref. (L13)

151-L. Plating Tin on Aluminium. J. M. Bryan. *Metal Industry,* v. 83, Dec. 18, 1953, p. 502-504.

Attempts to obtain by simple immersion a satisfactory deposit of tin on aluminum. Tables, graph. 1 ref. (L17, Sn, Al)

152-L. Draw Bushing Life Extended. *Metal-Working,* v. 10, Jan. 1954, p. 12-13.

Hard chromium plate prevents "pickup" of stainless stock. Photographs. (L17, F1, G21)

153-L. Underground Corrosion. V. New Techniques in Control. O. C. Mudd. *Oil and Gas Journal,* v. 52, Jan. 11, 1954, p. 127.

Need for better coatings, including greater resiliency and good bonding qualities. Graph. (L26, R8)

154-L. 1953—A Year of Accomplishment. H. Preuss. *Organic Finishing,* v. 14, Dec. 1953, p. 6-11.

Reviews industrial developments in the finishing field. Metal cleaning, new coatings, special decorative finishes, application methods, corrosion and miscellaneous products. Photographs. (L general)

155-L. Protective Coatings and Linings for Water Treating Equipment. James Boyd Smith. *Organic Finishing,* v. 14, Dec. 1953, p. 12-16.

Types of water treatment in current use and corrosion prevention measures employed. Photographs. (To be continued.) (L general, R4)

156-L. Precision Barrel Finishing. Malcolm M. Maynes. *Plating,* v. 41, Jan. 1954, p. 55-60.

Equipment, operating procedures and applications. Photographs. (L10)

157-L. A.E.S. Research Report Project no. 13. The Nature, Cause and Effect of the Porosity in Electrodeposits. I. The Porosity of Electrodeposits. Fielding Ogburn and Asaf Benderly. *Plating,* v. 41, Jan. 1954, p. 61-65.

Methods of studying porosity and corrodibility of electrodeposits. Photograph, micrograph, diagrams, tables, graph. 3 ref. (To be continued.) (L17)

158-L. Special Coatings for Metals Used at High Temperatures. A. H. Sully. *Product Engineering,* v. 25, Jan. 1954, p. 135-141.

Diffusion, refractory and low-emissivity coatings. Photographs, graphs. 3 ref. (L15, L27)

159-L. Barrel Finishing of Metal Products. The Use of a Slurry in Barrel Finishing. H. Leroy Beaver. *Products Finishing,* v. 18, Jan. 1954, p. 24-26, 28, 30, 32, 34.

Slurry; its use in finishing procedures. (L10)

160-L. Spotlighting Finishing Progress. Animal Fats in Hot-Dip Tinning. C. Fred Gurnham. *Products Finishing,* v. 18, Jan. 1954, p. 48, 50, 52, 54, 56, 58, 60, 62, 64.

Requirements for tinning oils. Progress on development of substitutes for imported palm oil. Diagram. (L16, Sn)

161-L. Insulation of Electrical Sheets by Mica-Phosphate Coatings. A. Wüstefeld. Henry Brutcher, Altadena, Cal., Translation no. 3092, 6 p. (From *Werkstoffe und Korrosion,* v. 2, no. 1, 1951, p. 16-17.)

Previously abstracted from original. See item 297-L, 1951. (L14, ST, SG-p)

162-L. Methods for Using Zinc Economically in Hot-Dip Galvanizing. H. Rückemesser. Henry Brutcher, Altadena, Cal., Translation no. 2937, 7 p. (From *Draht,* (German Ed.) v. 2, no. 8, Aug. 1951, p. 221-222.)

Steps recommended for minimizing formation of dross and zinc ashes in hot dip galvanizing and hints as to possibilities of recovering their zinc content right at galvanizing shop. (L16, Zn, CN)

163-L. General Principles. William Blum and Walter R. Meyer. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 1-46.

Summarizes principles and methods that find application in plating of various metals. Photomicrographs, photographs, table. 115 ref. (L17)

164-L. Methods of Control. Ralph A. Schaefer, Henry J. Sedusky and Betty Luce. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 47-63.

Tests and their significance in specification plating. Tables, photograph. 21 ref. (L17)

165-L. Alloy Plating. Charles L. Faust. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 64-97.

Important role that alloy plating can assume; operating principles. Graphs, micrographs, photographs, diagram. 101 ref. (L17)

166-L. Brass. Leonard E. Weeg and Harold J. Wiesner. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 98-115.

Principles, bath composition and functions of the constituents, bath operation, preparation of basis metal and maintenance and control. Tables. 49 ref. (L17, Cu)

167-L. Cadmium. K. G. Soderberg and Leon R. Westbrook. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 116-134.

Almost every plating bath characteristic of consequence is in favor of cyanide cadmium bath: its ability to give a dense, fine-grained deposit which may be made highly lustrous and reflective by use of brighteners that are stable in bath; high and easily balanced anode and cathode

efficiencies; excellent covering power and good plate distribution on recessed articles. (L17, Cd)

168-L. The Chromium Plating Process. George Dubpernell. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 135-177.

Methods of obtaining thin coatings for decorative purposes and "hard" or industrial deposits. Tests and control measures. Tables, graphs, photographs. 199 ref. (L17, Cr)

169-L. Properties of Chromium Plate. Cloyd A. Snavely and Charles L. Faust. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 177-187.

Chromium plate is unique among metal plates extensively used in commerce because of important bearing the structure of the plate has upon its uses and performance. Actually, many variations in structure and physical properties can be obtained by proper adjustment of plating conditions and post-plating treatments. Theory underlying these structural characteristics is reasonably complete and outlined in this paper. Micrographs, photographs, table. 24 ref. (L17, Cr)

170-L. Cobalt. Henry B. Linford. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 188-193.

Principles, functions of constituents of bath, operating conditions, maintenance and control, preparation of basis metals and finishing deposits and tests of deposits. Tables. 23 ref. (L17, Co)

171-L. Rochelle Copper. A. Kenneth Graham and Harold J. Read. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 194-213.

Rochelle copper, bath constituents, function of constituents of bath, operating conditions and characteristics of the rochelle-cyanide bath, maintenance and control, anodes, preparation of the basis metals and test of deposits. Tables, graph. 47 ref. (L17, Cu)

172-L. High Efficiency Cyanide Copper. R. R. Bair and D. A. Swalheim. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 213-225.

Functions of bath constituents, bath formulations, operating procedures, commercial plating and testing of deposits. Diagrams. 13 ref. (L17, Cu)

173-L. Pyrophosphate Copper. J. E. Stareck. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 225-231.

Principles, bath composition, operating conditions, maintenance and control, anodes, preparation of basis metal and tests of deposit. Tables. 21 ref. (L17, Cu)

174-L. Acid Copper Electroplating and Electroforming. William H. Safranek and J. Homer Winkler. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 231-251.

History and development, principles, functions of bath constituents, operating conditions, physical properties and structure of deposits, maintenance and control, anodes, equipment, tests of deposits, preparation of basis metals and mold and mandrels for electroforming. Tables, photographs. 99 ref. (L17, L18, Cu)

175-L. Gold. Louis Weisberg and A. Kenneth Graham. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 252-266.

Resistance to tarnish, oxidation at elevated temperatures and attack by most chemicals, combined with relative scarcity, high price and pleasing appearance, have limited gold to specific uses. Processes and tests. Tables. 26 ref. (L17, Au)

176-L. Indium. Henry B. Linford. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 267-270.

Chief application of indium plating is as a diffusion alloy in aircraft engine bearings. Tables. 19 ref. (L17, In)

177-L. Iron. C. T. Thomas and V. A. Lamb. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 271-281.

Iron plating is one of the minor factors in plating world. Although present applications of iron plating are limited, there is a continuing interest in electroforming. Typical baths and controls. Tables, photographs. 30 ref. (L17, L18, Fe)

178-L. Lead. A. H. Du Rose and William Blum. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 282-298.

Appearance and properties of lead limit its commercial use in electroplating largely to the field of corrosion protection. Tables, graph. 53 ref. (L17, Pb)

179-L. Nickel. W. L. Pinner, K. G. Soderberg and W. A. Wesley. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 299-355.

Covers use of nickel plating to protect metallic objects from corrosion, especially steel, brass and zinc die castings and, to a smaller extent, aluminum and magnesium alloys. Good appearance is usually im-

portant, and therefore nontarnishing chromium is usually applied on top of the nickel. Less frequently, gold or brass with a lacquer finish is used as a final coating. On account of its mechanical properties, nickel plating is used to some extent to repair worn parts, and for electroforming of printing plates, phonograph masters, sheet, tube, screen and many other articles. Methods and controls. Graphs, diagrams, tables, photomicrographs. 172 ref. (L17, Ni, Zn, Al, Mg)

180-L. Platinum Group Metals. K. Schumpelt. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 356-366.

The group of platinum metals is comprised of platinum, iridium, osmium, palladium, rhodium, ruthenium. Of these only platinum, palladium, and rhodium have found practical applications in the field of electroplating. Tables, graphs. 15 ref. (L17, EG-c, Pt, Ir, Os, Pd, Rh, Ru)

181-L. Silver. N. E. Promisel. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 367-386.

Silver plating which has to do only with deposition of smooth, dense, adherent deposits on a metal or alloy basis metal and does not include electroforming, electrorefining, etc. Tables. 29 ref. (L17, Ag)

182-L. Stannate Tin. Fred Bauch and F. F. Oplinger. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 389-410.

Discussion in two parts, one dealing with conventional sodium stannate plus sodium hydroxide system, the other with the potassium stannate plus potassium hydroxide system. Graphs. 38 ref. (L17, Sn)

183-L. Acid Tin. Paul R. Pine and A. H. DuRose. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 410-428.

Principles, sulfate and fluoborate solutions and tests of deposits. Photographs, tables. 67 ref. (L17, Sn)

184-L. Immersion Tinning. Frederick A. Lowenheim. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 429-434.

Two important industrial uses of immersion tin coatings. The so-called "liquor finish" on steel wire and tinning of aluminum alloy pistons for internal combustion engines and tinning the inside of copper tubing, which would not be susceptible to ordinary electroplating methods. Tables. 27 ref. (L17, L16, Sn)

185-L. Tin Alloys. Frederick A. Lowenheim. Paper from "Modern Electroplating." John Wiley & Sons, Inc., New York, p. 434-442.

Tin-copper or speculum, tin-nickel and tin-zinc alloy plating processes. Tables. 30 ref. (L17, Sn)

186-L. Acid Zinc. Ernest H. Lyons, Jr. and Hamnett P. Munger. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 444-459.

Development of electrogalvanizing, sulfate and chloride-type acid baths, zinc-ammonia bath, sulfate electroplating baths for strip and wire, zinc anodes, analytical methods, preparation of basis metals and tests of deposits. Tables. 42 ref. (L17, Zn)

187-L. Cyanide Zinc. R. R. Bair and L. J. Schustik. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 460-482.

The matte zinc deposit is generally used where rust protection or ductility is of prime importance, whereas the bright plating baths find application on articles requiring both corrosion protection and eye appeal. Graphs, tables. 30 ref. (L17, Zn)

188-L. Uncommon Metals. Frederick A. Lowenheim. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 483-510.

Review of published work concerning many metals which are not being, or cannot be, practically electrodeposited at present. 314 ref. (L17, Ac, Al, Sb, As, Be, Bi, Ca, Ce, Nb, Ga, Ge, Hf, La, Mg, Mn, Hg, Mo, Po, Pa, Re, Se, Ta, Te, Tl, Th, Ti, W, U, V, Zr)

189-L. Aluminum Alloys. Fred Keller. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 511-524.

Of different methods available, the zinc immersion method is now considered the most satisfactory and practical method for plating virtually all the different aluminum alloys with various other metals. Tables, diagrams, graph. 8 ref. (L17, Al, Mg, Zn)

190-L. Magnesium Alloys. H. K. DeLong. Paper from "Modern Electroplating." John Wiley & Sons, Inc., p. 524-535.

Covers cleaning and conditioning of magnesium surfaces, the zinc coating process, plating procedures and characteristics of plated finishes on magnesium. Photographs, tables. 6 ref. (L17, Cu, Ni, Cd, Cr, Ag, Mg, Cu, Zn)

191-L. (German.) **Phosphate Coating of Aluminum.** H. Ketterl. *Aluminium,* v. 29, no. 12, Dec. 1953, p. 509-513.

Interrelation of protective layer

and temperature of bath. Composition and quality of layers. Tables, graphs. 4 ref. (L14, Al)

192-L. (German.) **The Anodic Treatment of Strips and Wires.** E. Herrmann. *Aluminium,* v. 29, no. 12, Dec. 1953, p. 513-519.

Uniform anodic treatment of strips, multiple-stage formation of aluminum-condenser strips and composition of the electrolyte. Photographs, graphs, diagrams. (L19, Al)

193-L. (German.) **Surface of Sheet Metal and Pot Galvanizing.** H. Bablik. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 849-851.

Experiments have shown that any disturbance of surface grain of iron greatly increases pick-up of zinc and loss of iron. Use of flux to reduce loss of iron. Diagrams, tables, micrographs. 5 ref. (L16, Fe, Zn)

194-L. (German.) **Examples on the Application of the Spray Method of Zinc Coating in Germany.** R. Weber. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 852-854.

Principle, application and effectiveness as a rust preventive. Photographs, tables. 3 ref. (L23, Zn)

195-L. (German.) **Lead Cyanamide, a Rust-Resisting Pigment.** W. Roever. *Metall,* v. 7, no. 21-22, Nov. 1953, p. 876-877.

Properties and uses. (L26, Pb)

196-L. (German.) **Effect of Pickling and Steam Treatment on Corrosion Resistance of Aluminum.** H. Neunzig. *Metalloberfläche,* Ausgabe B, v. 5, no. 12, Dec. 1953, p. 181-184.

Results of numerous tests show that aluminum ware is best pickled in an acid mixture. Exposure of bright aluminum to steam was shown to prevent discoloration and increase corrosion resistance. Tables, photographs. 5 ref. (L12, R general, Al)

197-L. (German.) **Some Individual Reactions on the Metal-Water Boundary Layer.** Fritz Tödt. *Metalloberfläche,* Ausgabe A, v. 7, no. 12, Dec. 1953, p. 184-185.

Minute parts of a mono-atomic layer and true surface of the electrode can be measured by measuring amperage of generated galvanic current. The pH value of an aqueous solution can be determined directly at metal surface by determining effect of current density on potential. 3 ref. (L17, R1)

198-L. (German.) **The Use of Silicones in Treatment of Metal Surfaces.** Fritz Ohl. *Metalloberfläche,* Ausgabe A, v. 7, no. 12, Dec. 1953, p. 185-188.

Mechanical and chemical properties which make silicones valuable as corrosion inhibitors, high-temperature lubricants, paints, polishes and cements. (L26)

199-L. (German.) **The Causes of Formation of Semispherical Bubbles When Copper-Plating Die-Cast Zinc in Hot Baths.** W. Briese. *Metalloberfläche,* Ausgabe B, v. 5, no. 12, Dec. 1953, p. 188.

Bubbles are caused by evaporation of residual solvent through the pores. Means of avoiding this defect. (L17, Cu, Zn)

200-L. (German.) **A Method of Producing Uranium Oxide Films on Aluminum.** Siegfried Skorka. *Naturwissenschaften,* v. 40, no. 23, 1953, p. 605.

A simplified procedure. Graph. 2 ref. (L14, Al)

201-L. (Russian.) **Liquid-Abrasive Working of Metals.** K. P. Kochetov. *Stanki i Instrument,* v. 24, no. 10, Oct. 1953, p. 19-23.

Method of cleaning castings, forgings and rolled products which increases corrosion resistance. Tables, diagrams, photograph. (L10)

202-L. (Russian.) **Nature of the Phenomenon of the "Hard Tearing Off" of Cathode Zinc.** A. I. Levin, A. V. Pomosov and T. A. Tkachenko. *Zhurnal Prikladnoi Khimii,* v. 26, no. 12, Dec. 1953, p. 1238-1244.

Factors accompanying electrolysis process and their influence on properties of aluminum surface. Tables, diagram. 9 ref. (L17, Zn, Al)

203-L. (Russian.) **Corrosion of Aluminum Refrigerator Condensers in the Bath for the Electrodeposition of Zinc.** A. I. Levin, A. V. Pomosov and T. N. Rogatkina. *Zhurnal Prikladnoi Khimii,* v. 26, no. 12, Dec. 1953, p. 1245-1251.

Studies on conditions of electrochemical oxidation of aluminum to obtain protective films. Tables. 4 ref. (L14, Al, Zn)

204-L. (Russian.) **Erosional Stability of Anodic Oxide Films on Aluminum Alloys.** N. D. Tomashov, A. V. Shreider and A. V. Bialobzheskii. *Zhurnal Prikladnoi Khimii,* v. 26, no. 12, Dec. 1953, p. 1252-1257.

Influence of anodic oxidation on alteration of roughness of aluminum alloy surfaces. Diagrams, tables, graphs. 5 ref. (L19, Al)

205-L. **An Evaluation of the Use of the Refractory Oxides Al_2O_3 and SiO_2 in Eliminating a Gas-Produced Enamel Defect.** Richard G. Rion. *American Ceramic Society, Bulletin,* v. 33, Jan. 1954, p. 16-20.

Includes graphs, tables. 12 ref. (L27, CI, CN)

206-L. **New Al-Fin Developments Create New Design Opportunities.**

Randolph Hawthorne. *Aviation Age,* v. 21, Jan. 1954, p. 26-27.

Uses of molecular bonding of aluminum to steel are discussed. Photographs. (L22, Al, ST)

207-L. Chromium Electrodeposition. Lois Jean Frolen. *Chemistry,* v. 27, Jan. 1954, p. 34-39.

Investigation to find satisfactory theory concerning mechanism of chromium electrodeposition on a solid cathode. Photograph, phase diagrams, tables. (L17, Cr)

208-L. Metal Finishing in 1953: Some Highlights of the Year in Industry. Autolycus. *Electroplating and Metal Finishing,* v. 7, Jan. 1954, p. 4-7.

Present trend toward mechanization. Developments in nickel-chromium plating and other processes. (L general, Ni, Cr)

209-L. An Introduction to Throwing Power and Covering Power in Electroplating Solutions. I. R. Pinner. *Electroplating and Metal Finishing,* v. 7, Jan. 1954, p. 9-15.

Definitions and methods of testing. Diagrams, graphs. (To be continued.) (L17)

210-L. Porosity of Sprayed Coatings. III. Impregnation and Organic Finishing of Sprayed Coatings. D. de Paauw. *Electroplating and Metal Finishing,* v. 7; *Metal Spraying,* v. 4, Jan. 1954, p. 35, 37-38.

Process of sealing pores of sprayed metals to improve corrosion resistance. 33 ref. (L23)

211-L. Adherence Tests for Porcelain Enamels and High Temperature Ceramic Coatings. I. George Warren. *Finish,* v. 11, Jan. 1954, p. 33-35, 104-105.

Destructive-type tests and complete information on Porcelain Enamel Institute standard adherence test. Photographs, diagrams, graph, table. 9 ref. (L27)

212-L. The Finishing Story. Stanley Burns and Clark Luter. *Finish,* v. 11, Jan. 1954, p. W23-W28, W48.

Material quality control methods, production equipment, and processing routine for finishes. Photographs, flow sheet. (L general, S12)

213-L. What's New in Pipe Coatings? George D. Lain. *Heating, Piping & Air Conditioning,* v. 26, Jan. 1954, p. 164-165.

New plastics with metallic coating are proving to be successful in extending service life. Photograph, diagram. (L general)

214-L. Tests for Use on Vitreous Enamel Finishes. *Industrial Finishing (London),* v. 6, Dec. 1953, p. 346, 348.

Eight simple tests. (L27)

215-L. Finishing Titanium. Thomas A. Dickinson. *Industrial Finishing (London),* v. 6, Dec. 1953, p. 356-358.

Vacuum deposition, anodizing, and ceramic coating. Photographs. (L19, L25, L27, Ti)

216-L. How Airplane Parts Are Heat Treated to Withstand High Temperatures. *Industrial Gas,* v. 32, Jan. 1954, p. 6-7, 22-23.

Ryan Aeronautical Co. builds exhaust systems and other components for jet, piston, and rocket engines. Gas-fired ovens effect perfect bond of ceramic coating on metal, prolonging its life. Photographs. (L27, SG-h)

217-L. Tin-Nickel and Nickel-Chromium Coatings: Some Comparative Corrosion Tests. S. C. Britton and R. M. Angles. *Institute of Metal Finishing, Bulletin,* v. 3, Winter, 1953, p. 259-280.

Materials, methods of test, and results. Tables, photographs. 4 ref. (L17, R11, Sn, Ni, Cr)

218-L. Reducing Costs in the Paint Shop. A. Rice-Williams. *Institute of Metal Finishing, Bulletin,* v. 3, Winter, 1953, p. 281-287.

(L26)

219-L. Semiautomatic Plating Pays Where Sizes, Shapes Vary. T. Stoddard. *Iron Age,* v. 173, Jan. 14, 1954, p. 122-124.

Semi-automatic plating offers economy, high production, and good quality in shops where parts vary in shape, size, and finish. Photographs, diagram. (L17)

220-L. Conserve Critical Materials by Ceramic Coating of Jet Engine Hot Parts. J. V. Long. *Machine and Tool Blue Book,* v. 49, Jan. 1954, p. 244-247, 250, 252-254, 256-257.

Role of protective coatings in making possible substitution of lower alloys at high temperatures. Photographs. (L27)

221-L. Finishing Systems for Magnesium. Hugo A. Barbian. *Materials Methods,* v. 39, Jan. 1954, p. 102-105.

Requirements for finishing magnesium, finishing systems currently used and their service experience and new developments for finishing magnesium. Photographs, diagrams, tables. (L general, Mg)

222-L. Electroplating and Soldering as Allied Processes. Alan Whittaker. *Mechanical World and Engineering Record,* v. 134, Jan. 1954, p. 26-28.

Production of many components is facilitated by using processes of electroplating and soldering in combination. Methods are outlined which insure maximum efficiency when both processes are included in production layout. (L17, K7)

223-L. Technical Developments in 1953. Nathaniel Hall. *Metal Finishing,* v. 52, Jan. 1954, p. 52-61.
A year's progress in cleaning, pickling, polishing, metallic coatings, metallizing, testing, and control. 311 ref. (L general)

224-L. Electroplating in Turkey and Cyprus. Marvin Rubinstein. *Metal Finishing,* v. 52, Jan. 1954, p. 64-69.
A traveller's-eye view. Photographs. (L17)

225-L. Plating on Aluminum. Bernard E. Bunce. *Metal Finishing,* v. 52, Jan. 1954, p. 70-73, 76.
Phosphoric acid anodizing pretreatment. Table, diagram, photograph, micrograph. (L17, L19, Al)

226-L. Here's How Interstate Lines Pipe in Place to Prevent Internal Corrosion. M. B. Grove. *Oil and Gas Journal,* v. 52, Jan. 18, 1954, p. 109-110.
Technique of in-place plastic lining of pipe. Diagram. (L26)

227-L. New Methods for Engine and Compressor Maintenance. Robert S. Ridgway. *Petroleum Refiner,* v. 33, Jan. 1954, p. 110-115.
Useful methods affecting engine and compressor maintenance including resleeving power cylinders, metal spray conditioning, chromium plating cylinder walls, and new shop gadgets. Photographs. (L17, L23)

228-L. The Scope of Hot Spraying. H. J. Testro. *Product Finishing,* v. 6, Dec. 1953, p. 48-55.
Theory and practice of hot spraying of paints. Benefits and limitations. Photographs. (L26)

229-L. Review of Spray Guns. *Product Finishing,* v. 6, Dec. 1953, p. 93-102.
Assists firms in making choice of most suitable paint guns for particular applications. Photographs. (L26)

230-L. Electroless Plating in Production. Thomas A. Dickinson. *Sheet Metal Industries,* v. 31, no. 321, Jan. 1954, p. 19-21, 30.
Processes in a large-scale production plant. Photographs. (L16)

231-L. Regeneration of Spent Pickle Liquor. B. P. Martinez. *U. S. Bureau of Mines, Information Circular* 7672, Dec. 1953, 18 p. + 4 plates.
Proposed process is based largely on negative solubility slope of ferrous sulfate in temperature range 160 to 240° F. Diagrams. 21 ref. (L12)

232-L. Galvanizing Furnace With Combined Heating by Radiation and Circulation. H. Rückemesser. *Draht (English Ed.),* 1953, no. 17, Dec., p. 41-42.
Design, operating characteristics, advantages, and difficulties. (L16, Zn)

233-L. (Japanese.) **Examination of Foreign Paints for Bicycles.** Kichinosuke Ohhashi and Yoshindo Matsuda. *Reports of the Government Chemical Industrial Research Institute,* Tokyo, v. 48, no. 8, Oct. 1953, p. 307-310.
Comparison of modern products from USA, England, India, and Japan. Tables. (L26)

234-L. (Russian.) **Test in Production of Master Specimens of Accurate Surface by the Electroforming Method.** M. G. Boguslavskii. *Stanki i Instrument,* v. 24, no. 11, Nov. 1953, p. 19-20.
Method reproduced surface contour with good accuracy. Specimens are corrosion and wear resistant. Photographs, diagrams. (L18)

235-L. (Russian.) **Investigation of Cathode Processes During the Electrodeposition of Copper From Complex Electrolytes.** E. A. Ukshe and A. I. Levin. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 9, Sept. 1953, p. 1396-1403.
Effects of current density and various additives. Table, graphs. 18 ref. (L17, Cu)

236-L. Anodic Behavior of Aluminum and Its Alloys in Sulfuric Acid Electrolytes. Ralph B. Mason and Phyllis E. Fowle. *Electrochemical Society, Journal,* v. 101, Feb. 1954, p. 53-59.
Main factors affecting rate of solution of anodic oxide coatings on aluminum as they are being formed. Graphs. 13 ref. (L19, Al)

237-L. The Mechanism of the Anodic Formation of Lead Chromate. Carl Wagner. *Electrochemical Society, Journal,* v. 101, Feb. 1954, p. 60-62.
Diffusion and convection processes during the electrolysis of a solution of sodium chromate and sodium chlorate between lead electrodes. Graphs. 11 ref. (L19, Pb, Cr)

238-L. Inspection of Electroplated Aircraft Parts. P. Skeggs. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 15-26.
General inspectional requirements of D.T.D. specifications covering plating of aircraft parts. Sampling methods of testing and particular requirements of certain specifications. Surface treatment of zinc and cadmium coatings. Graphs, diagrams. (L17, S22, Cr, Ni, Ag, Zn, Cd)

239-L. A Non-Electrolytic Smoothing Treatment for Steel. W. A. Marshall. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 27-45; disc., p. 61-68 + 7 plates.

Part I: Work carried out to investigate conditions under which smoothing action takes place, together with results of some preliminary quantitative determinations of type and degree of smoothing achieved. Part II: Qualitative and quantitative investigations of adhesion obtained between smoothed and electrodeposited nickel. Tables, graphs, diagram. 4 ref. (L12, L17, ST, Ni)

240-L. The Nature of the Film Present on Iron After Brightening in Marshall's Solution. A. Hickling, W. A. Marshall and E. R. Buckle. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 47-60; disc., p. 61-68.

Investigation was undertaken with object of obtaining definite proof of existence of film and some indication of its nature, thickness, and mode of formation. Graphs, diagram. 4 ref. (L13, Fe)

241-L. Anodised Aluminium Surfaces for Wear-Resistance. William Campbell. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 273-291 + 2 plates.

Some experimental work in developing commercial production of hard oxide films on aluminum by anodizing, with particular reference to treatment of aluminum alloys of high alloy content. Diagrams, graphs, tables. (L19, Al)

242-L. A Commercial Gas Plating Process. *Electroplating and Metal Finishing,* v. 7, Jan. 1954, p. 16-18.

Principles and techniques of process. Diagram, table. (L15)

243-L. Semi-Automatic Handling Through Plating. *Flow,* v. 9, Feb. 1954, p. 86-87, 100, 102, 104-105.

Operation of semi-automatic system of nickel and chromium plating which increased production and reduced rejects. Photographs, diagram. (L17, Ni, Cr, Cu)

244-L. Developments in Vitreous Enamelling on Steel in the United States. Ernest M. Hommel. *Foundry Trade Journal,* v. 96, Jan. 7, 1954, p. 19-24.

Equipment and process employed. (L27)

245-L. Hard Facts About Hard Facing. John Wischhusen. *Industry & Welding,* v. 27, Feb. 1954, p. 49-53, 55, 84-85.

Equipment and techniques employed. Photographs, diagram. (L24)

246-L. Automatic Setup Buffs Intricate Aluminum Castings. James E. Taylor. *Iron Age,* v. 173, Jan. 21, 1954, p. 108-110.

Complicated aluminum castings are now being buffed automatically with good results. Photographs. (L10, Al)

247-L. Use of Magnetic Amplifiers in Control Circuits. R. T. Lucas. *Iron and Steel Engineer,* v. 31, Jan. 1954, p. 74-75; disc., p. 76-77.

Reports satisfactory application of magnetic amplifiers on loop control of pickle lines. (L12)

248-L. No Polishing Needed. Robert O. Johnson. *Precision Metal Molding,* v. 12, Feb. 1954, p. 54-58, 66.

High-vacuum metallizing on zinc or aluminum die castings. Photographs. (L25, Zn, Al)

249-L. Statistical Quality Control of Plating Operations. J. Forster-Cooper. *Product Finishing,* v. 7, Jan. 1954, p. 48-56.

Ways in which statistical quality control of automatic, semi-automatic, and still-vat plating operations is carried out in a large organization. Graphs, photographs. (L17, S12)

250-L. Hard Chrome Electroplating for Wear Resistance. T. R. Boggess. *Railway Locomotives and Cars,* v. 128, Feb. 1954, p. 67-69.

Description of equipment. Photographs. (L17)

251-L. Metallizing Experience at Two Iowa Plants. I. Marshalltown, Iowa. L. F. Skorczeski. **II. Fort Dodge, Iowa.** D. D. Douglas. *Sewage and Industrial Wastes,* v. 26, Jan. 1954, p. 89-93.

Surface preparation, equipment and plant experience. (L23)

252-L. Finishes for Metals: Inorganic and Protective Coatings. (Tool Engineering Report.) Robert A. Wason. *Tool Engineer,* v. 32, Feb. 1954, p. 81-88.

Choice and application of finishes. Table, photographs. (L general)

253-L. Turnabout at Rheem. Gilbert C. Close. *Western Machinery and Steel World,* v. 45, Jan. 1954, p. 95-98.

Technique of reversing usual procedure of metal finishing. Raw materials are primed, painted and even lithographed before actual production or fabrication of metal parts is started. Photographs. (L26)

254-L. The Mechanical De-Scaling of Low Carbon Steel Wire Rods. H. F. Sanderson. *Wire Industry,* v. 21, Jan. 1954, p. 53-55.

Design, operating characteristics, advantages and limitations of machine. 1 ref. (L10, CN)

255-L. Plant & Equipment. Continuous Spray Pickling Plant. *Wire Industry,* v. 21, Jan. 1954, p. 56, 59.

Design, construction and operation. Photograph. (L12)

256-L. New Electrosparking Process for the Hard Facing of Cutting Tools. G. P. Ivanov. Henry Brutcher, Altadena, Cal., Translation no. 2821, 13 p. (From *Stanki i Instrument,* v. 22, no. 5, 1951, p. 20-22.)

Previously abstracted from the original. See item 365-L, 1952. (L24, ST)

257-L. (Photocopy.) **Butyl Titanate Heat and Corrosion Resistant Paints.** PB110900. Australia Dept. of Supply, Defence Research Laboratories, Maribyrnong, Victoria. 22 p. 1954. Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00. Photostat $3.75.

Special applications and formulations. Conclusion is reached that commercial production of the butyl titanate polymer is well warranted for a rust-proofing material, as a protective coating against corrosion or heat. (L26)

258-L. (Book.) **Electrodepositors' Technical Society, Journal, (Annual Volume),** v. 28, 1951-1952. 291 p. Institute of Metal Finishing, Incorporating Electrodepositors' Technical Society, London, W. C. 1.

Includes 16 papers, individually abstracted. (L17)

259-L. (Book.) **Modern Electroplating.** Sponsored by the Electrochemical Society, Inc. Allen G. Gray, editor. 563 p. 1953. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $8.50.

Consists of 28 papers, individually abstracted. (L17)

260-L. (Book.) **Organic Protective Coatings.** William Van Fischer. 387 p. Rheinhold Publishing Corp., 330 W. 42nd St., New York 36. $7.50

Problems of formulation, specification and application of organic coatings. Fundamental theory and practice of paint as an engineering material. (L26)

261-L. (Book.) **Steel Structures Painting Manual.** Joseph Bigos, editor. **v. I. Good Painting Practice.** 432 p. 1953. Steel Structural Painting Council, 4400 Fifth Ave., Pittsburgh 13, Pa. $6.00.

Surface preparation and painting practices in various industries. Written from the viewpoint of paint users, it is practical encyclopedia of economical and satisfactory painting methods, rather than a technical treatise on paint formulation. Contains 18 chapters plus foreword, glossary, and index. (L26)

262-L. Carbide Flame-Plating. W. L. Donnelly. *American Society of Tool Engineers, Technical Papers and Panel Discussion,* v. 21, 1953, 5 p. + 3 plates.

Coatings from 0.0005 to 0.020 in. thick are currently being applied to a wide variety of base metals, including hardened toolsteels, copper, brass, aluminum and titanium. (L23)

263-L. Thirty Years' Experience in Testing Aluminum Paint Performance. Robert I. Wray. *Corrosion,* v. 10, Feb. 1954, p. 50-58.

Results achieved with coatings of various kinds, including different formulations of aluminum paint on steel and aluminum bases. Photographs. (L26, R11, Al)

264-L. The Use of Organic Protective Coatings in Controlling Corrosion. Edward G. Bobalek. *Corrosion,* v. 10, Feb. 1954, p. 73-81.

Composition, preparation and application of organic coatings. Mechanism by which coatings retard corrosion and relative value of barrier and polarizing coatings. Graph, tables. 2 ref. (L26, R general)

265-L. Hot Spray Lacquering of Naval Aircraft. William A. Gottfried. *Finish,* v. 11, Feb. 1954, p. 29-31, 82.

Surface preparation, metal conditioning, priming and lacquering. Diagram, tables. (L26)

266-L. Adherence Tests for Porcelain Enamels and High Temperature Ceramic Coatings. II. Application of Standard PEI Adherence Test to High Temperature Coatings. George Warren. *Finish,* v. 11, Feb. 1954, p. 53-54.

Results of experimental studies. Tables, photographs. (L27, Ni, SS, CN)

267-L. Electrostatic Detearing Improves Dip-Coating Quality. J. J. Obrzut. *Iron Age,* v. 173, Feb. 4, 1954, p. 153-155.

Smooth, uniform coatings are obtained on dip-coated parts by removing paint tears and fatty edges electrostatically. Photographs. (L26)

268-L. Some Aspects of High Speed Litho Coating. C. H. Groff. *Modern Lithography,* v. 22, Feb. 1954, p. 85, 87, 89.

Equipment and techniques involved. (L26)

269-L. How Chemical Cleaning Makes Money. J. T. Browning. *Petroleum Refiner,* v. 33, Feb. 1954, p. 131-132.

Case history of profitable application of chemical cleaning to restoration and cleaning of entire section of refinery. Photographs, diagram. (L12)

270-L. Radiometric Study of Supplementary Chromate Coatings for Zinc and Cadmium Plating. Stanley L. Eisler, Jodie Doss and Mary Ann

Henderson. *Plating,* v. 41, Feb. 1954, p. 147-154.

Radiosulfur and radiochromium were used to determine amounts of sulfate and chromium contained in coatings produced from various supplementary dip solutions. Tables. 5 ref. (L17, L16, S19, Zn, Cd)

271-L. Project no. 13: The Nature, Cause and Effect of the Porosity in Electrodeposits. I. The Porosity of Electrodeposits. Fielding Ogburn and Asaf Benderly. *Plating,* v. 41, Feb. 1954, p. 169-173.

Results of experimental studies. Tables, photographs. (L17)

272-L. Electroplating Plants Surveyed: Bright Nickel Plating. *Product Finishing,* v. 7, Jan. 1954, p. 66-70.

Equipment, plant layout and operating procedures. Photographs, table. (L17, Ni)

273-L. Flame Spraying Ceramics. Thomas A. Dickinson. *Products Finishing,* v. 18, Feb. 1954, p. 32, 34, 36.

Technique which may permit application of heat resistant ceramic coatings on materials like aluminum, magnesium and titanium as well as iron and steel products. Photographs. (L27, Al, Mg, Ti, Fe)

274-L. Automatic Process Control in Metal Plating. Leo Walter. *Products Finishing,* v. 18, Feb. 1954, p. 42-46, 48, 50, 52.

Practical considerations necessary for automation design. Photographs, diagrams. 1 ref. (L17, S18)

275-L. Protective Coating Fundamentals for Southern Industry. Raymond B. Seymour. *Southern Chemical Industry,* v. 6, Jan.-Feb. 1954, p. 6-8, 11-12.

Importance of application procedures. Photographs, table. (L general)

276-L. Anticorrosive Pigments. Arnold J. Eickhoff. Paper from "Organic Protective Coatings". Reinhold Publishing Corp. p. 61-80.

Four theories on the mechanism of corrosion. Photographs, graphs, tables, diagrams. 37 ref. (L26, R1)

277-L. Metal Protection With Synthetic Resin Coatings. E. E. McSweeney. Paper from "Organic Protective Coatings". Reinhold Publishing Corp. p. 304-321.

Four general factors affect ability of an organic coating to protect metal from corrosion. Their influence on formulation, application and performance of protective coatings. Micrographs, photograph, graphs, tables. 14 ref. (L26, R1)

278-L. Diffusion Coatings. D. M. Dovey, I. Jenkins and K. C. Randle. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. Institute of Metals, p. 213-236; disc., p. 295-364.

Mechanism involved in cementation processes in relation to adsorption and diffusion of the coating element. Photographs, graphs, table, micrographs. 27 ref. (L15)

279-L. The Nature and Properties of the Anodic Film on Aluminium and Its Alloys. H. W. L. Phillips. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. Institute of Metals, p. 237-252; disc., p. 295-364.

Film is hard and possesses little ductility, is translucent or transparent and is a good electrical insulator. Graphs, micrograph, spectrograms, table. 57 ref. (L19, Al)

280-L. (German.) **Rapid Control of Electrolytes Used in Precipitation of Metals. Effect of Fluorine in Zinc-Sulfate Solutions.** E. Bertorelle. *Metalloberfläche,* Ausgabe B, v. 6, no. 1, Jan. 1954, p. 2-5.

Use of triangular cell for determining composition and impurities in electrolytes by measuring flow of electric current. Table, graphs, micrographs, diagram, photograph. 4 ref. (L17)

281-L. (German.) **Further Development of the Technique of Metal Spraying.** Hans Reininger. *Metalloberfläche,* Ausgabe B, v. 6, no. 1, Jan. 1954, p. 6-11.

Literature review. Dickinson's process in which metal spray is concentrated on electrostatic fields, Hartmann's ultrasonic sprayer and Ballhausen's centrifugal metal sprayer. Photographs, diagrams, micrographs. 34 ref. (To be continued.) (L23)

282-L. Abrasion Resistance of Some Dry-Process Enamels. William C. Spangenberg. *American Ceramic Society, Journal,* v. 37, Feb. 1954, p. 48-51.

Resistance to abrasion of some dry-process cast iron enamels was investigated using the new weight-loss method of testing abrasion resistance now under development by the Porcelain Enamel Institute. Graphs, tables. 4 ref. (L27, Q9, CI)

283-L. Bond Failures in Babbitted Bearings. A. H. Lewis. *Canadian Metals,* v. 17, Feb. 1954, p. 40, 42, 44.

Investigation shows that rate of cooling and direction of casting are important variables in obtaining satisfactory bonds. Tables. (L16)

284-L. Tumbling or Barrel Finishing. H. Cox. *Canadian National Research Council, Technical Information Service Report no.* 33, Nov. 1953, 10 p.

Various finishing processes, media, compounds, equipment and operation. 28 ref. (L10)

285-L. East Anglian Founders Install Enamelling Plant. *Foundry Trade Journal,* v. 96, Feb. 4, 1954, p. 135-138.

Equipment, plant layout and operating procedures. Diagram, photographs. (L27)

286-L. How We Paint Steel Equipment for Stores. Les Slikkers. *Industrial Finishing,* v. 30, Feb. 1954, p. 26-28, 30, 32.

Metal cleaning and surface preparation operations. Photographs. (L26)

287-L. Dry Lubricant Film Put on Like Enamel. A. E. Brown. *Industrial Finishing,* v. 30, Feb. 1954, p. 50-52, 54, 56.

Coating material is a mixture of thermosetting resins, graphite and other ingredients which are compounded to provide specialized lubricative properties. Photographs. (L26)

288-L. Bright Plating Processes. *Industrial Finishing (London),* v. 6, Jan. 1954, p. 413-421.

Review of processes for bright deposition of copper, zinc, nickel, white brass and chromium, which can materially help to lower production costs and reduce polishing and buffing times. Table, graph. (L17, Cu, Zn, Ni)

289-L. Metal Finishing. *Iron Age,* v. 173, Feb. 18, 1954, p. 165.

Corrosion resistant coating using phosphorus alloyed with nickel has advantages of stainless steel. (L14, Ni)

290-L. Maintenance Painting. T. A. Banfield. *Industrial Finishing (London),* v. 6, Jan. 1954, p. 426-432.

Various corrosion conditions with applicable methods of prevention. Graph. (L26)

291-L. Mechanized Hard Chrome Plating Setup Is Fast and Efficient. Herbert Chase. *Iron Age,* v. 173, Feb. 18, 1954, p. 150-151.

Equipment and operating characteristics. Photograph. (L17, Cr)

292-L. Effect of Rust and Environment on Inhibition by Zinc-Rich Paints. J. E. O. Mayne. *Iron and Steel Institute, Journal,* v. 176, Feb. 1954, p. 140-143.

Paint films containing 96% zinc dust are capable of protecting rusty surfaces against corrosion by sea or rain water. Graphs, tables. 6 ref. (L26, R10, Zn)

293-L. Atmospheric Exposure Tests With Zinc-Rich Polystyrene Paints. J. E. O. Mayne. *Iron and Steel Institute, Journal,* v. 176, Feb. 1954, p. 143-146 + 1 plate.

Experimental methods and results. Table, photographs, graphs. (L26, R3, Zn)

294-L. New Epoxy Primer Has High Resistance to Alkalies. H. L. Farber. *Materials & Methods,* v. 39, Feb. 1954, p. 93-95.

Advanced flow coating technique combined with new primer permits thinner film thickness and improves corrosion resistance three times. Photographs. (L26)

295-L. Vacuum Metallizing Reduces Finishing Costs. *Materials & Methods,* v. 39, Feb. 1954, p. 108-109.

Equipment and techniques. Photographs. (L25)

296-L. Descaling the Stainless Steels. Lester F. Spencer. *Metal Finishing,* v. 52, Feb. 1954, p. 54-59.

Equipment and techniques employed in mechanical and acid descaling operations. Photographs, graphs, table. 6 ref. (L10, L12, SS)

297-L. Complex Cuprous Cyanide Compounds. Gunnar Gabrielson. *Metal Finishing,* v. 52, Feb. 1954, p. 60-64, 75.

Various alkali cuprous cyanides with special reference to electroplating field. Graphs, table. 22 ref. (L17, Cu)

298-L. Surface Preparation by Blast Cleaning Prior to Electroplating. Victor F. Stine. *Metal Finishing,* v. 52, Feb. 1954, p. 65-71.

Equipment, techniques, advantages and limitations. Diagrams, chart, photographs. (L10, L17)

299-L. Clad Metals for Stampings. Ernest C. Morse. *Modern Industrial Press,* v. 16, Feb. 1954, p. 44, 46, 48, 50, 52.

Discussion of clad plate, including bonding, forming and applications. Diagrams, photographs. (L22)

300-L. Paint and Corrosion. *Paint Manufacture,* v. 24, Feb. 1954, p. 61-62.

Electrical measurements in study of paint coatings on metal and mechanism of protection by paints. (L26, R11)

301-L. Surface Treatment and Finishing of Light Metals. VIII. S. Wernick and R. Pinner. *Sheet Metal Industries,* v. 31, no. 322, Feb. 1954, p. 115-122, 128.

Vitreous enameling of light alloys. Tables, graphs. 20 ref. (To be continued.) (L27, Al)

302-L. Controlled Hot Dip Galvanizing. II. K. S. Frazier. *Steel,* v. 134, Feb. 22, 1954, p. 102-103.

Length of submersion is vital question. Photographs, graphs. (To be continued.) (L16, Zn, CN)

303-L. New Aluminum Hard Surfacing Process Gives Hard, Abrasion Resistant Coating. A. Edward Zezula and John B. Franklin. *Western Metals,* v. 12, Feb. 1954, p. 53-55.

Mechanical properties of anodized castings. Photographs. (L19, Q general, Al)

304-L. (Dutch.) **The Effect of Accelerators in Phosphatizing.** E. J. Vollers. *Metalen,* v. 8, no. 23, Dec. 15, 1953, p. 415-418.

Various methods of accelerating phosphatizing process with aid of nitrates, nitrites and chlorates. Electrical and mechanical methods. Tables, graphs. 2 ref. (L14)

305-L. (German.) **Practical Experiences in Metallizing of Plastic Articles.** L. Hiesinger. *Kunststoffe,* v. 43, no. 12, Dec. 1953, p. 547-548.

High-vacuum technique. (L25)

306-L. (Russian.) **Influence of the Adsorption of Cations on the Electrodeposition of Copper from Pyrophosphate Electrolytes.** E. A. Ukshe and A. I. Levin. *Doklady Akademii Nauk SSSR,* v. 92, no. 4, Oct. 1, 1953, p. 799-801.

Measurements of cathode potentials of copper in presence of additions of tetrabutyl ammonia iodate to electrolyte showed increased polarization. Table, graphs. 5 ref. (L17, Cu)

307-L. (Russian.) **Low Alloy Steel for the Facing of Hydroturbine Blades.** I. R. Krianin and G. I. Babushkina. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb. p. 2-5.

Results of laboratory and industrial tests show that 20 GS-L steel meets mechanical and fatigue strength requirements. Tables, graphs, micrographs. 4 ref. (L24, Q7, AY)

308-L. An Introduction to Throwing Power and Covering Power in Electroplating Solutions. II. Effect of Operating Conditions on Throwing and Covering Power. R. Pinner. *Electroplating and Metal Finishing,* v. 7, Feb. 1954, p. 49-53, 59.

Effects of current density, pH, temperature, agitation, addition agents and surface structure. Graphs, tables. 42 ref. (L17, Cr, Cu, Ni, Zn)

309-L. Depreciation and Maintenance of Metal Finishing Plant. I. Modern Methods of Computation and Accounting. S. Howard Withey. *Electroplating and Metal Finishing,* v. 7, Feb. 1954. p. 54-55.

Detailed analysis of factors influencing depreciation and maintenance and various methods of computing costs. (To be continued.) (L general, A4, A5)

310-L. Adhesion and Surface Preparation in Protective Metal Spraying. I. J. M. Cowan. *Electroplating and Metal Finishing,* v. 7; *Metal Spraying,* v. 4, Feb. 1954, p. 79, 81-82.

Reviews adhesion of sprayed metal coatings. Methods of measuring adhesion quantitatively, influence of surface preparation and spraying conditions on adhesion and various types of grit and sand blasting equipment. Diagrams, tables. (To be continued.) (L23, L10)

311-L. A Plant for Applying Vitreous Enamel to Aluminum. J. M. Steele. *Finish,* v. 11, Mar. 1954, p. 38-40, 66.

Detailed layout, outline of equipment requirements and brief review of application routine. Diagram. (L27, Al)

312-L. The History of Phosphatizing. L. K. Schuster. *Finish,* v. 11, Mar. 1954, p. 45-46, 68-69, 82.

Historical discussion of subject of growing importance to all manufacturers of fabricated sheet metal products. (L14, CN)

313-L. Protective Coatings and Linings for Water Treating Equipment. James Boyd Smith. *Organic Finishing,* v. 15, Feb. 1954, p. 13-15.

Coatings for degasifier units and filtration, coagulation and chemical feeding equipment. 14 ref. (L general)

314-L. Recent Developments in Silicone Vehicles for Maintenance Paints. R. C. Hedlund. *Organic Finishing,* v. 15, Feb. 1954, p. 16-18.

Fast-drying silicone vehicle, silicone-alkyd co-polymer and modified silicone-alkyd resins. Photographs, tables. (L26)

315-L. Statistical Quality Control of Plating Solutions. A. D. Woodell. *Product Finishing,* v. 7, Feb. 1954, p. 48-52, 112.

Includes graphs. (L17, S12)

316-L. Choosing Your Paint. E. Johnson. *Product Finishing,* v. 7, Feb. 1954, p. 53-58, 108, 110.

Factors to be considered, including suggestions for various tests that can be applied for checking quality of paints. (L26)

317-L. Technical Problems in the Finishing Shop. Barrel Plating Considerations. E. E. Halls. *Product Finishing,* v. 7, Feb. 1954, p. 61-72, 112.

General considerations in employment of this process. Diagrams. (L17)

318-L. The Scope of Slidabrading. *Product Finishing,* v. 7, Feb. 1954, p. 73-76.
Details of new tumbling process. Diagrams, table, photographs. (L10)

319-L. Liquid Honing in Russia. *Product Finishing,* v. 7, Feb. 1954, p. 80-83.
Recently installed plant for cleaning castings by jets of liquid mixed with abrasive material and directed on to the work surface by compressed air. Diagrams, tables. (L10)

320-L. Review of Electroplating Plant. II. *Product Finishing,* v. 7, Feb. 1954, p. 84-90.
Representative selection of anodes, jigs and polishing machines. Photographs, table. (L17)

321-L. Hot Dip Galvanizing. II. Control of Dross Formation. K. S. Frazier. *Steel,* v. 134, Mar. 1, 1954, p. 98-99.
Controls of timing temperature and cleanliness of work automatically improve uniformity and product quality. Photograph, diagram, graphs. (L16, Zn, CN)

322-L. Wire Galvanizing Techniques in the U. S. A. *Wire Industry,* v. 21, Feb. 1954, p. 155, 157, 161-162, 170.
Plant equipment and procedures. Diagrams, photograph. (L16)

323-L. Kinetics of Coating Phenomena, in Particular of Phosphating Process. W. Machu. *Henry Brutcher, Altadena, Calif. Translation no.* 2806, 21 p. (From *Archiv für Metallkunde,* v. 3, no. 6, 1949, p. 203-208.)
Previously abstracted from original. See item 7B-182, 1949. (L14, CN)

324-L. Recommended Practices for the Cleaning, Inspection and Testing of Steam Generator Coils to Determine Their Condition and Eliminate Failure. Andrew J. Ritter, chairman. Paper from "Official Proceedings of the 1953 Annual Meeting Master Boiler Makers' Association", p. 52-57; disc., p. 57-66.
(L10, L12)

325-L. Study and Recommendation for the Washing and Cleaning of Diesel Locomotive Water Tanks. F. E. Godwin, chiarman. Paper from "Official Proceedings of the 1953 Annual Meeting Master Boilermakers' Association", p. 75-82; disc., p. 83-86. 1953.
(L12)

326-L. (Dutch.) **Organic Coatings for Corrosion Protection.** T. van der Klis. *Bedrijf en Techniek,* v. 9, no. 195, Jan. 30, 1954, p. 50-53, 65.
Application and effectiveness of various organic coatings. Diagrams, tables. 5 ref. (L26)

327-L. (French.) **Continuous Strip Electrolytic Tinning.** M. W. de Laminne. *Ossature metallique,* v. 18, no. 12, Dec. 1953, p. 602-604; disc., p. 604-605.
Paper presented at International Congress of Information Centers on Steel at Brussels. Process of producing electrolytic tin plate. Photograph, diagrams. (L17, CN, Sn)

328-L. (German.) **The Preparatory Treatment of Metallic Surfaces Previous to Painting and the Latest Development in Cleaning and Preservation Practice.** Bernhard F. H. Scheifele. *Werkstoffe und Korrosion,* v. 5, no. 1, Jan. 1954, p. 5-10.
Importance of surface preparation for corrosion resistance and durability of organic protective coatings. 30 ref. (L26, L10, L12)

329-L. (Book.) **American Electroplaters' Society, Proceedings (Annual Volume),** v. 40, 1953. 154 p. American Electroplaters' Society, 445 Broad St., Newark, N. J.
Consists of 20 papers abstracted separately. (L17)

330-L. (Book—German.) **(Riedel's Handbook of Electroplating.) Riedel's Ratgeber der Galvanotechnik.** 2nd Ed. 320 p. 1952. Verlag Delius, Klausen and Co., Bielefeld u. Berlin. 6.80 D.M.
A general introduction to electroplating and related surface treatments. (L17)

331-L. Al-Fin in Aeronautical Engineering. *Aeroplane,* v. 86, Feb. 26, 1954, p. 247-248.
Method for bonding cast iron, steel and similar materials to aluminum and its alloys. Mechanical and physical properties of the bond. Photomicrograph, photographs. (L22, Al, CI, ST)

332-L. Hard Facing in Ceramic Industries. William L. Lutes and Harry F. Reid. *American Ceramic Society, Bulletin,* v. 33, Mar. 1954, p. 79-82.
Proposed classification system for hard facing alloys. Selection of alloys for surfacing ceramic manufacturing equipment. Tables, photographs, graph. (L24)

333-L. Barrel Finishing. . .More Art Than Science. Leonard Giglio. *American Machinist,* v. 98, Mar. 15, 1954, p. 125-127.
There is "one best way" for each material, finish, part size and shape and desired result. Method is set

up for versatility as well as efficiency. Photographs. (L10)

334-L. New Aircraft Coating for Corrosion Prevention. M. W. Larson. *Aviation Age,* v. 21, Feb. 1954, p. 62-65.

Epoxy resin paint developed to give resistance to Skydrol hydraulic fluid was found to be an excellent protective coating for use in exhaust path areas as well. Table, graphs. (L26)

335-L. The Protective Action of Pigments on Steel. M. J. Pryor. *Electrochemical Society, Journal,* v. 101, Mar. 1954, p. 141-148.

Action of aqueous extracts from litharge, metallic and red leads, basic lead carbonate and zinc and zinc oxide on corrosion of steel was investigated. Tables, graphs, diagram. 24 ref. (L26, R general, ST)

336-L. Electrochemical and Electrometallurgical Industries of Canada. IV. Saskatchewan, Alberta, British Columbia, the Yukon, and Northwest Territories. A. C. Holm. *Electrochemical Society, Journal,* v. 101, Mar. 1954, p. 67C-72C.

Present state and future trends. Photograph. (L17, C23)

337-L. Anodic Oxide Films on Tantalum Electrodes. I. Thickness and Current Efficiency of Formation. II. Field and Ionic Current During Formation. III. Photo Effects. L. Young. *Faraday Society, Transactions,* v. 50, Feb. 1954, p. 153-171.

Oxide films from few tens to several thousand Å in thickness can be produced on tantalum electrodes by anodic polarization. Part I: Methods of determining thickness of films. Part II: Kinetics of formation process. Part III: Photo effects. Diagram, tables, graphs. 34 ref. (L19, Ta)

338-L. Silver and Gold Plated Finishes. *Industrial Finishing (London),* v. 6, Feb. 1954, p. 480-491.

Review of small lot plating processes. Applications. Photographs. (L17, Au, Ag)

339-L. Temporary Protective Coatings. *Industrial Finishing (London),* v. 6, Feb. 1954, p. 501-504.

Reviews scope, nature and efficiency of available systems for protection against corrosion during temporary storage or idle periods. Table. (L general)

340-L. Corrosion and Preservation of Industrial Steelwork. L. A. Ravald. *Industrial Finishing (London),* v. 6, Feb. 1954, p. 508-514, 520, 522, 524, 526.

Corrosion of mild structural steel and protection by various coatings. Photographs, table, chart. (L general, R general, CN)

341-L. Zinc Plate on Cartridge Cases Meets Rigid Specifications. C. E. Fisher and D. F. Zlatnik. *Iron Age,* v. 173, Mar. 11, 1954, p. 135-139.

Equipment and techniques of process. Table, diagram, photograph. (L16, Zn)

342-L. Deburring: Modern Methods, Tools Cut Costs. I. John E. Hyler. *Iron Age,* v. 173, Mar. 11, 1954, p. 140-143.

Improved methods, equipment and tools can cut costs of operation. Photographs, diagrams. (L10)

343-L. Electrical Measurements in the Study of Immersed Paint Coatings on Metal. I. Comparison Between Capacitance and Gravimetric Methods of Estimating Water-Uptake. D. M. Brasher and A. H. Kingsbury. *Journal of Applied Chemistry,* v. 4, Feb. 1954, p. 62-72.

Includes graphs, tables. 6 ref. (L26)

344-L. Chromium-Plating Gun Bores. C. E. McDowell. *Machinery (London),* v. 84, Feb. 26, 1954, p. 437-441.

Equipment and operating procedures. In addition to hardness, electrodeposited chromium shows low coefficient of friction, good corrosion resistance and high seizure resistance. Photographs. (L17, Cr, ST)

345-L. Industrial Hard-Chromium Plating. Warren Schmidt and William E. Hogan. *Mechanical Engineering,* v. 76, Mar. 1954, p. 248-254.

Facts mechanical engineers should know about modern plating techniques. Photograph, tables, graph. (L17, Cr)

346-L. Electro-Osmotic Examination of Paint Films. II. J. K. Wirth and Willi Machu. *Paint, Oil & Chemical Review,* v. 117, Mar. 11, 1954, p. 26-29, 44.

Equipment and techniques for measuring porosity of films. Results explain some aspects of corrosion under protective coatings. Tables, diagram, graph. 6 ref. (L26)

347-L. A.E.S. Research Report: Project no. 12. Cleaning and Preparation of Metals for Electroplating. VIII. Effect of Oxide Films. A Survey of Literature. Henry B. Linford and David O. Feder. *Plating,* v. 41, Mar. 1954, p. 279-286.

Summarizes previous work on effects of electroplating onto oxide-soiled basis metals. (To be continued.) (L17, L12)

348-L. Ultrasonic Cleaning. *Precision Metal Molding,* v. 12, Mar. 1954, p. 65-66.
Application of ultrasonic energy for agitating action, in combination with correct solvent degreasing cycle, is one of the newer methods of cleaning soil from metal surfaces. Photographs. (L10)

349-L. $22,500 Saved Each Year in Cleaning Dies. *Precision Metal Molding,* v. 12, Mar. 1954, p. 69-70.
Cleaning method of blasting with nonmetallic abrasives suspended in liquid. Photograph. (L10)

350-L. Paint Specifications for Metal Products. Paul E. Marling. *Product Engineering,* v. 25, Mar. 1954, p. 173-181.
Recommends finish formulations and application procedures for eight major classes of industrial products. Specific information connecting properties and composition. Photographs, table. 9 ref. (L26)

351-L. Flow Coating Range and Heater Parts. Ezra A. Blount. *Products Finishing,* v. 18, Mar. 1954, p. 24-31.
Flow coating is a paint finishing process that lends itself well to mechanized finishing. Photographs, diagram. (L26)

352-L. Spotlighting Finishing Progress. Seymour Senderoff. *Products Finishing,* v. 18, Mar. 1954, p. 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 74, 76, 78, 80.
Finishing of aluminum, finishing aluminum die castings and formation of immersion zinc coatings on aluminum. Photographs, tables, graphs, diagrams.
(L general, Al, Zn)

353-L. Chemical Polishing of Steel. W. A. Marshall. *Research,* v. 7, Mar. 1954, p. 89-93.
Surfaces of ferrous materials may be smoothed and polished by chemical method which has advantages over electropolishing process. Technique has applications to both engineering and decorative manufactures. Oscillograms, graph, table, micrographs, photograph. (L12, ST)

354-L. Surface Treatment and Finishing of Light Metals. IX. S. Wernick and R. Pinner. *Sheet Metal Industries,* v. 31, no. 323, Mar. 1954, p. 223-226.
Organic finishing of aluminum and its alloys. Photographs. (To be continued.) (L26, Al)

355-L. Hot Dip Galvanizing. III. Materials and Methods. K. S. Frazier. *Steel,* v. 134, Mar. 8, 1954, p. 138-139.
To protect advantages of controlled hot dip galvanizing, all phases of base materials and preparatory processes must be thoroughly investigated. Micrographs, photographs, table. (L16)

356-L. (English.) **The Development of the Chromising Process.** Karl Daeves. *Draht (English Ed.),* 1954, no. 19, Feb., p. 30-32.
Chromizing process and its advantages in industry. Photograph.
(L15, Cr)

357-L. (French.) **Continuous Galvanizing of Steel Strips.** M. A. Ollivet. *Métallurgie et la construction mécanique,* v. 86, no. 1, Jan. 1954, p. 49-51.
With respect to output, economy, quality and employees' working conditions. Photograph, diagram.
(L16, ST, Zn)

358-L. (French.) **New Development in the Regeneration of Pickling Baths.** Jean Labergere. *Métallurgie et la construction mécanique,* v. 86, no. 2, Feb. 1954, p. 127-128.
Ruthner process whereby baths used are continuously concentrated by evaporation and contact with gaseous hydrochloric acid. Diagrams. (L12)

359-L. (French.) **Research on the Galvanizing of Cooking Utensils.** A. Gordet. *Métallurgie et la construction mécanique,* v. 86, no. 2, Feb. 1954, p. 129-131.
Compares weights of utensils before and after galvanizing. Tables. (To be continued.) (L16, Zn)

360-L. (French.) **General Remarks on the Production of Tin Plate.** Louis Gascuel. *Métallurgie et la construction mécanique,* v. 86, no. 2, Feb. 1954, p. 133-135.
Production methods, tin coating, electrolytic tinning and various kinds of tin plate. Diagram, photographs. (L16, L17, Sn, ST)

361-L. (French.) **Protection of Aluminum and Its Alloys With Paints. I.** André Guilhaudis and Régine Bourbon. *Revue de l'Aluminium,* v. 31, no. 206, Jan. 1954, p. 7-10.
Importance of proper surface preparation. Various cleaning methods and coatings. Photographs. (To be continued.) (L26, Al)

362-L. (German.) **Chemical Polishing.** H. Spähn. *Metalloberfläche,* Ausgabe B, v. 6, no. 2, Feb. 1954, p. 17-26.
Bath composition for aluminum and copper alloys. Graphs, micrographs, photographs, table. 10 ref. (L12, Al, Cu)

363-L. (Russian.) **Adhesion of Zinc Coats to Basic Metal.** K. M. Gorbunova and P. D. Dankov. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 11, Nov. 1953, p. 1725-1730.

Scaling was shown to depend on preliminary passivation in various media to which the metal was subjected. Diagrams, table, micrograph. 15 ref. (L16, Zn)

364-L. Production of Vitreous-Enamelled Iron Castings. A. Adam. *Foundry Trade Journal,* v. 96, Mar. 4, 1954, p. 249-254.

Investigates defect phenomena occurring during enameling. Objective is improved product, greater reliability and popularity of process. Photograph, graph. (L27, CI)

365-L. Apparent Density of Thin Evaporated Films. M. S. Blois, Jr., and L. M. Rieser, Jr. *Journal of Applied Physics,* v. 25, Mar. 1954, p. 338-340.

Measurements of copper and silver films formed by evaporation and manifestations of low apparent densities in physical experiments. Graphs, diagrams. 10 ref. (L25, P10, Cu, Ag)

366-L. The New Look in Galvanized Steel. Ernest W. Horvick. *Materials & Methods,* v. 39, Mar. 1954, p. 107-109.

Highly corrosion resistant, attractive and workable coating made possible by modern, controlled processing. Photographs. (L16, Zn, ST)

367-L. Surface Treatment and Finishing of Light Metals. I. Development, Applications and Finishes. S. Wernick and R. Pinner. *Metal Finishing,* v. 52, Mar. 1954, p. 56-59, 69.

Properties and advantages of light metals with particular emphasis on aluminum and its alloys. (L general, Al, Mg)

368-L. A Radiometric Study of the Iron Phosphating Process. Stanley L. Eisler and Jodie Doss. *Metal Finishing,* v. 52, Mar. 1954, p. 60-63.

Amount of $FePO_4 \cdot 2H_2O$ contained in phosphate coatings prepared from solutions of H_3PO_4, NaH_2PO_4 and from commercial iron phosphating preparation determined radiometrically. Tables, photographs. 5 ref. (L14)

369-L. Electroless Nickel Barrel Plating. Harry J. West. *Metal Finishing,* v. 52, Mar. 1954, p. 64.

Commercial production, explaining and outlining exact procedure, type of equipment and formulas. (L14, Ni)

370-L. Emulsifiable Solvent Cleaning. B. J. Sherwood. *Metal Finishing,* v. 52, Mar. 1954, p. 70-72.

Operating characteristics and technical advantages of process. Composition and properties. Diagram. (L12)

371-L. Preparation and Selection of Felt Finishing Wheels. *Metal-Working,* v. 10, Apr. 1954, p. 20-21.

Guide for selecting proper speeds and wheel for specific jobs. Tables, drawings. (L10)

372-L. These Remarkable Epoxys. Charles A. Cerami. *Organic Finishing,* v. 15, Mar. 1954, p. 15-18, 23.

Combining epoxy group of resin finishes with phenolic or urea resins or fatty acids results in materials of great versatility. Photographs. (L26)

373-L. Custom-Finishing Busses and Trucks. Howard E. Jackson. *Organic Finishing,* v. 15, Mar. 1954, p. 19-23.

Cleaning and priming, spray painting and drying. Photographs. (L10, L11, L26)

374-L. Small Parts Finishing and Calculation of Finishing Costs. E. M. Yacko. *Organic Finishing,* v. 15, Mar. 1954, p. 24-26.

Choice of finishing method and cost factors in finishing operation. (L general)

375-L. Modern Coatings Add Service Life. *Steel,* v. 134, Mar. 15, 1954, p. 102-103.

In maintenance of buildings and structures, synthetic-binder paints and mastics offer top performance under most adverse corrosive conditions. Photographs. (L26)

376-L. Research on Electrodeposition in Great Britain. G. E. Gardam. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 1-13; disc., p. 13.

Review of type and magnitude of research effort. Detailed description of few important recent researches. (L17)

377-L. Electroplating Research in France. Jean Salauze. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 15-21; disc., p. 21-22.

Work involves use of perchloric acid in electropolishing. Table. 18 ref. (L13)

378-L. Electroplating Research in Germany, Belgium, and Holland. P. Baeyens. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 23-26.

Cheaper methods of obtaining brightness through use of bright-plating solutions, periodic reverse current and electrolytic polishing. (L17, L13)

379-L. Electrodeposition Research at the National Bureau of Standards. William Blum. Paper from "Electro-

deposition Research". National Bureau of Standards Circular 529. p. 27-28.

Nine projects under consideration by electrodeposition section. (L17)

380-L. Electrodeposition Research at Battelle Memorial Institute. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 29-34; disc., p. 34-35.

Includes "Introduction", C. L. Faust; "An Investigation of Electrodeposited Alloys and Pure Metals as Substitutes for Zinc and Cadmium for Protective Finishes for Steel Parts of Aircraft", A. B. Trippler, Jr.; "The Mechanism of Hydrogen Entry Into Metals", L. D. McGraw; and "Electroforming Aluminum", W. H. Safranek. (L17, L18)

381-L. Electrodeposition Research in Progress at Armour Research Foundation. William H. Colner. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 41-45; disc., p. 45-46.

Reasons and experiments for plating titanium. Silver plating of wave guides and deposition of magnetic nickel-cobalt alloy. Micrographs, graphs.
(L17, Ti, Ag, Ni, Co)

382-L. Electrodeposition Research of Westinghouse Electric Corporation. George W. Jernstedt. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 47-50; disc., p. 50-52.

Laboratory procedure and operations. Leveling investigated in periodic reverse current (PR) method. (L17)

383-L. Brass Plating. K. G. Compton and R. A. Ehrhardt. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 53-54; disc., p. 55.

Brass-plating solutions producing deposits containing between 65 and 75% of copper, with a minimum variation of composition at current density for rubber adhesion.
(L17, Cu)

384-L. Electroplating in the Sleeve-Bearing Industry. R. A. Schaefer. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 57-62; disc., p. 62-63.

Trimetal bearing construction and electroplated overlaps considered. Diagrams, table, graph, micrographs. 8 ref. (L17, T7)

385-L. Research at Enthone, Inc. on Metal Finishing. Walter R. Meyer. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 65-68; disc., p. 68.

Includes conversion coatings; blackening and coloring of metals; chemical displacement coatings; oxide coatings on metals; selective dissolution of metals; study of detergents, cleaning processes; pickling inhibitors, or methods pertaining to preparation of metals for electroplating; stripping of organic coatings; and study of electroplating solutions. (L general)

386-L. Determination of Impurities in Electroplating Baths. Earl J. Serfass. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 73-79.

Summary of approach to problem and results achieved. Tables. (L17)

387-L. Effects of Impurities in Plating Solutions. D. T. Ewing, John K. Werner and Arthur Brouwer. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 81-88; disc., p. 88-89.

Changes caused by single metallic impurities in physical properties of electrodeposited nickel from four types of nickel-plating solutions. Graphs, tables. 7 ref. (L17, Ni)

388-L. Porosity in Perspective. Nathaniel Thon. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 91-94.

Simple method and apparatus whereby gas permeability of electrodeposits can be measured and expressed numerically by a permeability constant. (L17)

389-L. Correlation of Gas Permeability of Electrodeposits With Their Weathering Behavior. Fielding Ogburn and Asaf Benderly. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 95-96; disc., p. 96-99.

Photographing gross porosity was employed instead of microscopic survey method. (L17, R2)

390-L. Properties of Electrodeposited Nickel. Abner Brenner. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 101-111; disc., p. 111-112.

Relations between physical properties, structure and composition of deposits. Graphs, photomicrographs, charts, radiographs.
(L17, Q general, P general, M27, Ni)

391-L. Current and Metal Distribution in Electrodeposition. John Kronsbein. Paper from "Electrodeposition Research". National Bureau of Standards Circular 529. p. 121-124.

Correlates mathematical approach and experimental research for current distribution of various anode-cathode arrangements. Table, graphs. 3 ref. (L17)

392-L. The Use of Ceramic Coatings in Gas Turbine Combustion Chambers. F. G. Code Holland. Paper from "Selected Government Research Reports V. X. Ceramics and Glass" Her Majesty's Stationery Office, London, p. 1-7.

Benefits resulting from application of ceramic coatings. Reduction in flame tube temperature calculated to be of the order of 80° C. Table. 3 ref. (L27)

393-L. The Production and Uses of Tin Coatings. Frederick A. Lowenheim. Paper from "Symposium on Tin". ASTM Special Technical Publication no. 141. p. 25-37; disc., p. 37-40.

Properties, methods of application, problems and recent developments in tin and tin-alloy coatings. 32 ref. (L16, L17, Sn)

394-L. Trends in the Use of Tin in the Container Industry. R. R. Hartwell. Paper from "Symposium on Tin". ASTM Special Technical Publication no. 141. p. 41-49; disc., p. 50-51.

Properties of tin plate; tin consumption statistics; and effect of new materials and coating methods on consumption. Graphs, tables. 7 ref. (L16, L17, A4, Sn)

395-L. (German.) **Tin-Zinc Alloy Deposits.** Hermann Heinemann. *Metalloberfläche,* Edition B, v. 6, no. 3, Mar. 1954, p. 33-35.

Working specifications for proper electroplating of metals with tin-zinc alloy claimed to be superior to tin plating as a protection against rusting and in hardness and wear-resistance. (L17, Sn, Zn)

396-L. (German.) **Mechanical Surface Improvement (Grinding and Polishing) of Metals in England.** W. Edwards. *Metalloberfläche,* Edition B, v. 6, no. 3, Mar. 1954, p. 35-38.

Effect of design and preliminary treatment on quality of work. Nature of a polish and mechanical and electrical processes. Working conditions and use of holding devices. Diagrams. 5 ref. (L10, G18)

397-L. (German.) **Further Development of the Technique of Metal Spraying.** Hans Reininger. *Metalloberfläche,* Edition B, v. 6, no. 3, Mar. 1954, p. 39-42.

Advantages and disadvantages of different surfaces for better adherence. Structure and properties of layers as function of grain size and spraying conditions. Diagrams, table, micrographs, photographs. 17 ref. (L23)

398-L. (German.) **The Anodic Behavior of Aluminum and Al-Mg Alloys in Sulfuric Acid and Sodium Sulfate Solutions.** Willi Machu and M. Kamal Hussein. *Werkstoffe und Korrosion,* v. 5, no. 2, Feb. 1954, p. 49-54.

Only one cathodic polarization had slight effect on loosening of oxide film. Rapid passivation always follows this activation. Graphs. 8 ref. (L19, Al, Mg)

399-L. (German.) **Reaction Primers and Metal Painting.** Benno Elfisch. *Werkstoffe und Korrosion,* v. 5, no. 2, Feb. 1954, p. 54-56.

Methods of making reaction primers. Composition depends on nature and properties of metallic surface to be protected. 7 ref. (L26)

400-L. Ceramic-Coated Metals for Industry. Burnham W. King. *Battelle Technical Review,* v. 3, Apr. 1954, p. 39-42.

Chemical and mechanical properties of materials, nature of bond between ceramic coating and metal, protection afforded metal and industrial applications. Graph, drawing. (L27)

401-L. Why Go to Thick Protective Coatings? R. R. Pierce. *Chemical Engineering,* v. 61, Apr. 1954, p. 177-179, 181.

Experimental studies. Graphs. 3 ref. (L general)

402-L. Epoxys for Cements & Coatings. Raymond B. Seymour and Robert H. Steiner. *Chemical Engineering,* v. 61, Apr. 1954, p. 244 + 4 pages.

Resistance to chemical corrosion and physical properties. Charts. (L27)

403-L. Cadmium for Plating Connectors. D. C. Hubbard, R. W. Kunkle and A. B. Chance. *Electrical World,* v. 141, Mar. 29, 1954, p. 47-48, 50.

Fortified cadmium and hot-flowed electro-tin plate are desirable materials for plating connectors used in aluminum-to-copper connections. Micrographs, graphs, charts. (L17, Cd, Sn)

404-L. Factors Affecting the Choice of Finish for Electrical Equipment. E. C. J. Marsh. *Electroplating and Metal Finishing,* v. 7, Mar. 1954, p. 88-91.

Choice is influenced by function of finish, conditions under which it will be used, practicability of incorporating necessary finishing op-

erations in total production sequence and cost of the finish selected. Tables, photographs. (To be continued.) (L general, T1)

405-L. Electroplating of Powder Metal Compacts. R. Rushbrook. *Electroplating and Metal Finishing,* v. 7, Mar. 1954, p. 92-96.

Difficulties involved in applying electroplated finishes are mainly those of removing cleaning or plating solutions entrapped in pores. Five techniques presented. Micrographs, photograph. 10 ref. (L17, H general, Fe, Cu)

406-L. Adhesion and Surface Preparation in Protective Metal Spraying. II. The Effect of Blasting Conditions. J. M. Cowan. *Electroplating and Metal Finishing,* v. 7; *Metal Spraying,* v. 4, Mar. 1954, p. 117, 119, 121-122.

Effect of grit-blasting conditions on adhesion, as well as effect of basis and coating metals and metal spraying conditions. Graphs, tables. 16 ref. (L23)

407-L. Molecular Bonded Bimetallic Components. *Engineer,* v. 197, Mar. 12, 1954, p. 387-389.

Principal applications of Al-Fin process. Specialized uses in general engineering and military fields. Table, graph, photographs. (L22, T general)

408-L. New Methods for Finishing Powder Metal Parts. Charles C. Cohn. *Iron Age,* v. 173, Apr. 1, 1954, p. 125-128.

Field-tested finishing techniques have improved to a point where plated powder metal parts are far superior in corrosion resistance to metal parts plated by standard methods. Table, photograph. (L17, H general)

409-L. Current Density Distribution in Electroplating by Use of Models. Gilbert Ford Kinney and John V. Festa. *Plating,* v. 41, Apr. 1954, p. 380-384.

Method of utilizing models in study of electric fields set up about irregular electrode in plating bath. Diagrams, graphs. 2 ref. (L17)

410-L. Tentative Recommended Practice for Preparation of Copper and Copper-Base Alloys for Electroplating. *Plating,* v. 41, Apr. 1954, p. 385-386, 391-393.

Tentative ASTM standard. 1 ref. (L17, S22, Cu)

411-L. Metal Reflector Finishing. E. B. Heyer. *Plating,* v. 41, Apr. 1954, p. 394-396.

Miscellaneous finishing operations that are performed on metal reflectors for motion picture projection-arc service. Photographs. (L general)

412-L. A.E.S. Research Report: Project no. 12. Cleaning and Preparation of Metals for Electroplating. VIII. Effect of Oxide Films. A Survey of the Literature. Henry B. Linford and Davis O. Feder. *Plating,* v. 41, Apr. 1954, p. 397-401.

Oxide film affects adhesion and microstructure of electroplate. Tables. 115 ref. (L17)

413-L. New Angles for the Galvanizing Line. I. D. A. McArthur, A. R. Geiszler and John Upton, Jr. *Steel,* v. 134, Apr. 5, 1954, p. 100-102.

Molten zinc is kept at operating temperature in a ceramic-lined pot that is heated by induction. Diagram, photographs. (L16)

414-L. Cleaning Metal With Sonic Waves. T. J. Kearney. *Steel,* v. 134, Apr. 5, 1954, p. 104-105.

Transducers convert electrical energy to ultrasonic energy which vibrates cleaning solution. Difficult soils in hard-to-get-at locations are readily removed. Photographs. (L10)

415-L. The Applications of Blast Cleaning in Steel Processing. I. Victor F. Stine. *Steel Processing,* v. 40, Mar. 1954, p. 159-163, 194.

Blast cleaning offers industry three basic advantages—speed, low cost and high quality of finish. Photographs. (L10, ST)

416-L. Ultrasonics and Industrial Cleaning. William L. McCracken. *Tool Engineer,* v. 32, Apr. 1954, p. 66-68.

Digest of "Ultrasonic Techniques in Industrial Cleaning", to be presented at the 22 Annual ASTE Meeting. Equipment, techniques and applications. Diagrams, photographs. (L10)

417-L. (Book.) **Selected Government Research Reports. v. X. Ceramics and Glass.** 148 p. 1952. Her Majesty's Stationery Office, Box 569, London S.E. 1, England. $5.75.

Reports on refractory coatings for metals, apparatus for determining mechanical and physical properties of ceramic materials, applications of ceramic bodies in heat engines, hot pressing zirconium carbide, fractures in glass, and the testing of glass optical flats. (L27, H general)

418-L. Uses of Ultrasonics in Degreasing Processes. Thomas J. Kearney. *Acoustical Society of America, Journal,* v. 26, Mar. 1954, p. 244-246.

Detrex Soniclean process com-

bines sound energy and trichlorethylene solvent degreasing for metal cleaning. Photographs.
(L10, L12)

419-L. Laboratory and Plant Evaluations of Liquid Neoprene Coatings. R. B. Seymour. *Corrosion,* v. 10, Apr. 1954, p. 116-121.

Characteristics of several compositions, application and curing techniques, resistance to certain chemicals and conformity with military and industrial standards. Table. 6 ref. (L26)

420-L. Minimizing Contact Potential in Apparatus Design. E. C. J. Marsh. *Electronic Engineering,* v. 26, Apr. 1954, p. 148.

Choice of electroplated, sprayed or hot-dipped coatings can materially assist in design problems. Photographs, tables. (L general, P15)

421-L. Bi-Metallic Bonding. *Engineering,* v. 177, Mar. 26, 1954, p. 409.

Properties of aluminum and ferrous metals are combined in bonding. Micrograph, photograph, drawings. (L22, Al, Fe)

422-L. Metal Spraying for Corrosion Prevention. C. A. Robiette. *Industrial Finishing (London),* v. 6, Mar. 1954, p. 564-570, 572-573.

Equipment, methods and applications. Drawing, photograph. 4 ref. (L23)

423-L. New System Cuts Waste Pickle Liquor Disposal Costs. D. A. Dahlstrom. *Iron Age,* v. 173, Apr. 8, 1954, p. 150-153.

Design, operating procedures and advantages. Photographs, diagram, graph, table. (L12)

424-L. Production Tin-Zinc Alloy Plating. Alan Whittaker. *Machinery (London),* v. 84, Mar. 26, 1954, p. 639-642.

Characteristics of coating, equipment, techniques and variables influencing process. 2 ref.
(L17, Sn, Zn)

425-L. Two New High Temperature Coatings. Alexander Pechman. *Materials & Methods,* v. 39, Apr. 1954, p. 94-96.

Flame-sprayed cermet and weld-through ceramic described. Materials, equipment and techniques of processes. Photographs. (L27)

426-L. Quality Hard Facing. John Wischhusen. *Materials & Methods,* v. 39, Apr. 1954, p. 140-142.

Advantages, applications and techniques of process and factors affecting quality of hard facing. Photographs. (L24)

427-L. Surface Preparation of Steel for Painting. Joseph Bigos. *Metal Progress,* v. 65, Apr. 1954, p. 123-126, 154, 156.

Methods of solvent, hand, power tool and flame cleaning. Photographs. (L10, L12, ST)

428-L. How to Make Iron Powder Components Resistant to Rust and Wear. Richard P. Seelig. *Precision Metal Molding,* v. 12, Apr. 1954, p. 103-106.

Method involves reaction between a chromium-rich gas and ferrous surface followed by diffusion. Applied to sinterings, forgings, castings and machined parts. Table, micrographs, photographs.
(L15, H11)

429-L. Technical Problems in the Finishing Shop: Maintaining Efficiency in Trichlorethylene Degreasing Plants. E. E. Halls. *Product Finishing,* v. 7, Mar. 1954, p. 55-69, 118.

Development of process, equipment, techniques and applications. Tables, graphs, photograph, diagram. (L12)

430-L. Production Barrel Plating to Specifications. Ezra A. Blount. *Products Finishing,* v. 18, Apr. 1954, p. 24-32, 34, 36.

Equipment, plant layout and operating procedures. Photographs, diagram. (L17)

431-L. Flat Polishing. Adam Zimmerman. *Products Finishing,* v. 18, Apr. 1954, p. 56 + 9 pages.

History, applications, construction of equipment and techniques of process. Diagram, graphs, table.
(L10)

432-L. Continuous Galvanizing Line. II. Design Is Key to Simple Controls. D. A. McArthur, A. R. Geiszler and John Upton, Jr. *Steel,* v. 134, Apr. 12, 1954, p. 102-104.

Division of line into three sections affords excellent arrangement for good control system. Close speed regulation between sections for synchronization is eliminated. Photographs. (L16, Zn)

433-L. Steel Wears a Topcoat. Robert Froman. *Steelways,* v. 10, Apr. 1954, p. 24-27.

Method for covering cheap but strong carbon steel with costlier metals possessing special properties. Photographs. (L22, CN)

434-L. Preparation, Properties and Optical Applications of Thin Films of Titanium Dioxide. Georg Hass. *Vacuum,* v. 2, Oct. 1952, p. 331-345.

Optical properties, structure and oxidation of evaporated titanium

films. Structure, properties and applications of titanium dioxide coatings. Graphs, radiographs, tables, diagrams. 22 ref. (L25, P17, Ti)

435-L. The Distribution of Thin Films Condensed on Surfaces by the Vacuum Evaporation Method. L. Holland and W. Steckelmacher. *Vacuum,* v. 2, Oct. 1952, p. 346-364.

Problem of determining laws of distribution of thin film deposits evaporated in vacuum. From various types of practical sources, idealized sources are evolved for which emission of vapor can be calculated. Diagrams, tables, graphs. 26 ref. (L25)

436-L. Aluminium Reflecting Films Applied to Glass and Plastics by Thermal Evaporation. I. Aluminium Films on Glass With Particular Reference to Front Surface Mirrors. S. Bateson. *Vacuum,* v. 2, Oct. 1952, p. 365-376.

Fundamental principles governing deposition of aluminum films upon various materials. Tables, drawing, photograph, graphs. 10 ref. (To be continued.) (L25, Al)

437-L. Impregnation of Steel With Titanium in a Mixture of Molten Sodium Carbonate and Titanium Dioxide. S. Kowal. *Henry Brutcher, Altadena, Calif., Translation no.* 3152, 12 p. (From *Prace Instytutow Mechaniki* (Warsaw), 1953, no. 6, p. 5-12.)

Experimental materials and procedure. Effect of treating time and temperature upon case thickness. Micrographs, graphs, tables. 11 ref. (L14, CN, Ti)

438-L. (English.) **The Effects of Space Charge on the Rate of Formation of Anode Films.** Jacob F. Dewald. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 340-341.

Discrepancies in data on anodic oxidation of tantalum analyzed and explained. Graph. 2 ref. (L19, Ta)

439-L. (French.) **Advantages Derived From Use of Aluminum in Galvanizing.** R. Souské. *Métaux, Corrosion-Industries,* v. 29, no. 342, Feb. 1954, p. 88-89.

Deoxidizing action, adherence properties and effect on zinc-iron alloy. Graphs. (L16, Al, Zn)

440-L. (French.) **Protection of Aluminum and Its Alloys With Paints. II.** André Guilhaudis and Régine Bourbon. *Revue de l'Aluminium,* v. 31, no. 207, Feb. 1954, p. 47-51.

Efficiency of protection given by primary coatings and finishes. Graphs, micrographs, table. 4 ref. (L26, Al)

441-L. (French.) **The Continuous Galvanizing of Steel Strip by Sendzimir Process.** A. Ollivet. *Revue de métallurgie,* v. 51, no. 1, Jan. 1954, p. 17-24 + 1 plate; disc., p. 25-27.

Special heat treatment in controlled atmosphere before galvanizing causes oxidizing and reducing reactions, changes in crystal structure and increased temperature of strip, insuring perfect adherence of coating. Photographs, diagrams. (L16, Zn, CN)

442-L. (French.) **The Tube Galvanizing Shop of the Société Lorraine Escaut.** J. Fleischmann. *Revue de métallurgie,* v. 51, no. 1, Jan. 1954, p. 28-34; disc., p. 34-35.

Successive operations, output, consumption of zinc and fuel and byproducts obtained. Diagram, photographs, graphs. (L16, Zn)

443-L. (French.) **Effect of the Quality of Coating on Corrosion Resistance of Galvanized Steel Wires.** Jean Hérenguel. *Revue de métallurgie,* v. 51, no. 1, Jan. 1954, p. 36-44; disc., p. 44.

Thickness, structure, brittleness and accelerated corrosion tests. Tables, graphs, micrographs, diagram. (L16, R general, CN, Zn)

444-L. (German.) **Research on Formation of Pores and Pin Points in Highly Acid-Resistant Enamelled Cast-Iron Apparatus.** Jens Holm and Hildegard Schneider. *Silikat Technik,* v. 5, no. 1, Jan. 1954, p. 13-22.

Nondefective coatings produced on cast iron with high phosphorus and sulfur content. Tables, graphs, micrographs, diagram. (L27. CI)

445-L. (German.) **Preparation and Passivation of Light Metals for Painting.** Bernhard F. H. Scheifele. *Werkstoffe und Korrosion,* v. 5, no. 3, Mar. 1954, p. 94-98.

Method produces metal organic protective films by use of reactive primers. Films function as anticorrosive coatings and adhesive substrates for paint and lacquer coatings. 12 ref. (L12, L26, Al, Mg)

446-L. (Russian.) **Microscopic Study of Cementation of Copper by Nickel Powder.** A. A. Bulakh and R. K. Drachevskaia. *Zhurnal Prikladnoi Khimii,* v. 26, no. 11, Nov. 1953, p. 1225-1226.

Because of surface heterogeneity or impurities, a short-circuited galvanic element is formed on each grain of nickel powder. Diagram, micrographs. 4 ref. (L15, H16, Cu, Ni)

447-L. Ryan Develops Ceramic-Liner Techniques. *Aviation Week,* v. 60, Apr. 26, 1954, p. 38, 40, 42.

New ways to apply and work with coatings point to solution of some high-heat power plant problems. Photographs. (L27)

448-L. Coating With Mastics. Raymond B. Seymour and Robert H. Steiner. *Chemical Engineering,* v. 61, May 1954, p. 232 + 5 pages.

Asphaltic mastics protect steel against splash and fumes of salts, alkalis and nonoxidizing acids up to 150° F. Photographs, charts. (L26, ST).

449-L. Resin Bonded Chemical Treatments. "Wash Primers" for Metal Surfaces. M. D. Phelps. *Finish,* v. 11, May 1954, p. 67-68, 84-85.

Development of primer composed of phosphoric acid, vinyl butyral resin and special zinc chromate pigment. Tables. (L14)

450-L. Automatic Cleaning, Painting of Mult-a-Frame Channels. M. M. Roberts. *Industrial Finishing,* v. 30, Apr. 1954, p. 28-32, 37-38.

Conveying system automatically handles products for finishing process. Large units occupy two stories. Photographs, diagrams. (L26, L12)

451-L. New Low-Cost Coating Gives Mild Steel Good Corrosion Resistance. G. J. Harvey. *Iron Age,* v. 173, Apr. 15, 1954, p. 125-127.

Fast, low-cost application of a nickel-phosphorus coating gives mild steel corrosion resistant properties comparable to some stainless steels. Application by brushing, dipping or spraying. An oxide of nickel is reduced on coated surface at a temperature much lower than that of either the base metal or nickel. Photographs, micrograph, graph. (L14, CN)

452-L. Aluminum Hard Coating Methods Review. *Light Metal Age,* v. 12, Apr. 1954, p. 10-11, 24.

Materials, equipment, techniques and applications. Photographs, tables. (L24, Al)

453-L. HAE Process. Harry Evangelides. *Light Metal Age,* v. 12, Apr. 1954, p. 12-13, 33-34.

Techniques and characteristics of magnesium hard surfacing. Photographs, diagram. (L14, Mg)

454-L. Plating on Lead Alloys, Pewter and Britannia. Joseph Haas. *Metal Finishing,* v. 52, Apr. 1954, p. 56-61.

Practical, simple and accurate method of plating any metal on lead and tin alloys. (L17, Pb, Sn)

455-L. Metallizing With an Aqueous Platinic Chloride Solution. Louis Silverman and Katherine Trego. *Metal Finishing,* v. 52, Apr. 1954, p. 69.

Solution containing selected reducing agent may be applied to many shapes of aluminum oxide, porcelain, ceramics, silicaware, quartz and etched Pyrex. Adherent, electrical conducting coating of pure platinum is obtained. 8 ref. (L14, Pt)

456-L. Bronze and Speculum Plates Provide Good Protection for Steel. W. H. Safranek, W. G. Hespenheide and C. L. Faust. *Metal Finishing,* v. 52, Apr. 1954, p. 70-73, 78.

Salt-spray and outdoor-exposure tests demonstrate bronze alloy plate protects steel better than copper and/or nickel plates. Tables, photographs, micrograph. 16 ref. (L17, ST, Cu, Ni)

457-L. A Porosity Test for Electrodeposits on Zinc-Base Die-Castings. H. K. Lutwak. *Metal Finishing,* v. 52, Apr. 1954, p. 76-78.

Materials, apparatus and techniques. 8 ref. (L17, Zn)

458-L. Finishing Supplement. Sprayed Metallic Coatings. H. Reininger. *Metal Industry,* v. 84, Mar. 26, 1954, p. 251-253; Apr. 2, 1954, p. 265-266; Apr. 9, 1954, p. 291-293.

Dependence of adhesive strength of coatings on surface condition of the metal. Surface preparation and treatment after coating. 83 ref. (L23, Cd, Sn, Bi, Pb, Sb, Zn, Al)

459-L. Chemical Plating Process. I. A. Campbell. *Modern Metals,* v. 10, Apr. 1954, p. 68, 70-71.

New process will help relieve nickel shortage and provides same protection as electroplating using only ½ to 1/3 as much nickel. It is fast, accurate and nonelectric. Photographs. (L14, Ni)

460-L. The Navy's Search for Anti-Corrosive Coatings for Magnesium. George W. Grupp. *Organic Finishing,* v. 15, Apr. 1954, p. 15.

Magnesium chromate and magnesium fluoride plus zinc chromate is an improvement. "Micalith-G" and calcium chromate are good. (L14, Mg)

461-L. Production Barrel Plating to Specifications. Ezra A. Blount. *Products Finishing,* v. 18, Apr. 1954, p. 24-32, 34, 36.

Copper, nickel, zinc and cadmium can be plated in barrel plating installation recently completed. Photographs, diagrams. (L17, Cu, Ni, Zn, Cd)

462-L. The Finishing of Aluminum. Structural Features of Oxide Coatings on Aluminum. Seymour Senderoff. *Products Finishing,* v. 18, Apr. 1954, p. 78 + 4 pages.

Decorative and protective oxide coatings formed in electrolytes containing sulfuric or chromic acids. Diagram, table, micrographs. (L14, Al)

463-L. Metal Finishing Practice at the Denham Works of Martin-Baker Aircraft Co. Ltd. *Sheet Metal Industries,* v. 31, no. 324, Apr. 1954, p. 284-287.

Methods of anodizing and dyeing of light alloys, nickel, copper, chromium and cadmium plating, hard chromium plating on light alloys, chromate treatment of magnesium, phosphate treatment of ferrous parts and black finishes on brass and stainless steel. Photographs. (L general)

464-L. Surface Treatment and Finishing of Light Metals. IX. S. Wernick and R. Pinner. *Sheet Metal Industries,* v. 31, no. 324, Apr. 1954, p. 320-324, 340.

Various types of organic coatings and applications. Tables, photographs. (To be continued.) 19 ref. (L26, Al)

465-L. The Applications of Blast Cleaning in Steel Processing. II. Blast Cleaning Machines. Victor F. Stine. *Steel Processing,* v. 40, Apr. 1954, p. 231-236, 253.

Numerous types of blast cleaning machines developed classified in general groups according to type of work for which they have been designed. Photographs, tables. (L10, ST)

466-L. (French.) **Struggle Against Corrosion of Iron. Protection by Painting.** Albin Marty. *Métallurgie et la construction mécanique,* v. 86, no. 3, Mar. 1954, p. 235 + 6 pages.

Preparation of surfaces, types of paints and application. (L26, Fe)

467-L. (French.) **New Degreasing Agent. Paroxal 2.** Georges Riviere. *Revue de l'Aluminium,* v. 31, no. 208, Mar. 1954, p. 101-102.

Contains phosphoric acid. Possesses cleaning and etching power. Tables. (L12, Al)

468-L. (German.) **Experiments on Sand-Blasting Media.** W. Gesell. *Giesserei,* v. 41, no. 7, Apr. 1, 1954, p. 160-163.

Service life curves of granulated cast iron scrap and silica. Graphs. (L10)

469-L. (German.) **Prevention of Corrosion in Mineral-Oil Storage Tanks.** H. B. Footner. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 3, Mar. 1954, p. 72-75.

Preparation and coating of inside and otuside of storage equipment. (L26, R7)

470-L. (German.) **Selected Methods of Heating Zinc-Plating Tanks.** Josef Kohlgrüber, Josef Leutbecher, and Theodor Türk. *Stahl und Eisen,* v. 74, no. 8, Apr. 8, 1954, p. 464-474.

Three new possibilities of heating galvanizing tanks. Examples of application and relative thermal and economic efficiencies. Diagrams, graphs, photographs. 4 ref. (L16, Zn)

471-L. (Russian.) **Controlling the Properties of Ground Enamel Coats for Steel.** K. P. Azarov. *Zhurnal Prikladnoi Khimii,* v. 27, no. 1, Jan. 1954, p. 33-42.

Comparison of coatings with and without boron. Additions of strong fluxes. Graphs, diagrams, tables. 10 ref. (L27, ST)

472-L. (Russian.) **Electrochemical Deposition of Very Hard Gold Coats.** N. P. Fedot'ev, N. M. Ostroumova and P. M. Viacheslavov. *Zhurnal Prikladnoi Khimii,* v. 27, no. 1, Jan. 1954, p. 43-50.

Optimum conditions of deposition in gold-nickel baths. Precipitates tested for microhardness and wear resistance. Tables, graphs. 7 ref. (L17, Q9, Q29, Au, Ni)

473-L. (Russian.) **Removing the Coat of Lead-Tin Alloy From Lead-Treated Iron.** V. P. Kochergin. *Zhurnal Prikladnoi Khimii,* v. 27, no. 1, Jan. 1954, p. 51-54.

Increased temperatures and concentration of potassium hydroxide or addition of meta-nitrobenzoic acid accelerate removal of zinc and tin. Table, graphs. 6 ref. (L12, Fe, Sn, Pb)

474-L. (Russian.) **Structure of Copper-Nickel Anodes and Process of Sediment Formation.** A. A. Bulakh and O. A. Khan. *Zhurnal Prikladnoi Khimii,* v. 27, no. 1, Jan. 1954, p. 111-112.

Amount of sedimentation on cast alloy anodes shown to be higher than on annealed alloy anodes. Table. 7 ref. (L17, Cu, Ni)

475-L. (Russian.) **Reactivation of Electrolyte for Polishing Steel.** N. P. Fedot'ev, E. G. Kruglova and S. Ia. Grilikhes. *Zhurnal Prikladnoi Khimii,* v. 27, no. 2, Feb. 1954, p. 157-165.

Reasons for cessation of electrolytic activity and method of regeneration. Tables, graphs. 4 ref. (L13, ST)

476-L. (Russian.) **Potentials of Copper and Nickel Sulfides.** A. A. Bulakh and O. A. Khan. *Zhurnal Prikladnoi Khimii,* v. 27, no. 2, Feb. 1954, p. 166-170.

Composition of electrolyte and electrode used. Tables, graphs, diagram. 5 ref. (L17, Cu, Ni)

477-L. (Russian.) **Influence of Thiocarbamide on Electrocrystallization of Nickel.** L. I. Antropov and S. Ia.

Popov. *Zhurnal Prikladnoi Khimii,* v. 27, no. 2, Feb. 1954, p. 206-209.

Possibility of producing lustrous nickel precipitates. Graphs, micrographs. 6 ref. (L17, Ni)

478-L. Advances in Electroplating. W. H. Safranek. *Battelle Technical Review,* v. 3, May 1954, p. 49-52.

Uses and improvements in electroplating, bronze as a substitute for nickel, special electroplates and electropolishing. Micrograph, oscillograms. (L17, L13, Cu)

479-L. Recent Advances in Electrodeposition. J. W. Cuthbertson. *Birmingham Metallurgical Society, Journal,* v. 33, Dec. 1953, p. 156-172.

Review of new and improved processes. Tables, micrographs, photographs, graphs, diagram. 14 ref. (L17)

480-L. Contribution to the Theory of Electropolishing. Carl Wagner. *Electrochemical Society, Journal,* v. 101, May 1954, p. 225-228.

Ideal process is characterized by plateau of current density-potential curve corresponding to maximum diffusion rate of acceptor for metal ions toward anode. Graphs. 15 ref. (L13)

481-L. Adherence of Electrodeposited Zinc to Aluminum Cathodes. F. H. C. Kelly. *Electrochemical Society, Journal,* v. 101, May 1954, p. 239-243.

Apparatus and techniques for measuring adherence. Diagram, tables. 6 ref. (L17, Al, Zn)

482-L. Theory and Practice of Chemical Polishing. III. The Theory of Chemical Polishing. R. Pinner. *Electroplating and Metal Finishing,* v. 7, 1954, p. 127-131, 140.

Theory of metal dissolution in acid solution. Various types of film growth and their importance in suppressing etch-attack. Graphs. 13 ref. (L12)

483-L. Factors Affecting the Choice of Finish for Electrical Equipment. E. C. J. Marsh. *Electroplating and Metal Finishing,* v. 7, 1954, p. 132-135.

Typical examples of equipment and techniques. Photographs. (L general, T1)

484-L. Depreciation and Maintenance of Metal Finishing Plant. II. "Straightline" Method of Computing Depreciation of Pumps, Tanks and Storage Plant. S. Howard Withey. *Electroplating and Metal Finishing,* v. 7, 1954, p. 136-138.

Method calculates and records depreciation in capital value of specific units and groups of equipment. Tables. (To be continued.) (L general, A5)

485-L. The G.K.N. Micro-Hardness Tester in Metal Finishing. *Electroplating and Metal Finishing,* v. 7, 1954, p. 147-148.

Instrument and performance characteristics. Photograph, micrograph. (L general, Q29)

486-L. De-Icing With Sprayed Metal. *Electroplating and Metal Finishing,* v. 7; *Metal Spraying,* v. 4, Apr. 1954, p. 159, 161-163.

Theory, operation and production of Napier heating mat on aircraft. Alloy coating is sprayed on a resin base. Graph, photographs. 4 ref. (L23)

487-L. The Fluorine and Chromium Contents of Treated Aluminium Surfaces. R. Holt. *Journal of the Science of Food and Agriculture,* v. 5, Apr. 1954, p. 173-176.

Studies indicate lacquered cans made from Alocrom-treated aluminum would not be dangerous to health. Tables. 6 ref. (L26, Al)

488-L. Nickel Plating Troubles and Cures. O. A. Stocker, A. Korbelak and S. A. Carrano. *Plating,* v. 41, May 1954, p. 491-496.

Lack of adhesion and ductility, dull, spotty, rough or streaky deposits, burnt edges and pitting. Chart. (L17, Ni)

489-L. Radiometric Study of the Chromium-Sulfate Complex Formed in Chromium Plating Baths. Ronald L. Sass and Stanley L. Eisler. *Plating,* v. 41, May 1954, p. 497-501.

Ionic nature of coordination complex formed and amount of sulfate so complexed. Tables. 11 ref. (L17)

490-L. A.E.S. Research Report: Project No. 6; Porosity of Electrodeposited Metals. XIII. Variation of the Gas Permeability Constant With Pressure Difference. N. Thon and Douglas Dean. *Plating,* v. 41, May 1954, p. 503-505.

Improved permeability apparatus by means of which measurements have been made over larger foil areas. Apparatus used to study variation of permeability as function of overpressure. Diagram, graphs. (L17)

491-L. (German.) **Testing Pickling Additions for Their Effectiveness.** Hubert Hoff and Georg von der Dunk. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 115-123.

Process determines inhibiting effect, stability and effects of time and dissolved iron on different inhibitors. Photographs, graphs, tables. 23 ref. (L12, Fe)

492-L. (German.) **Hydrogen Pick-Up of Austenitic Steels in a Cathodic**

Charge. Friedrich Eisenkolb and Günter Ehrlich. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 187-194.

Effect of type of electrolyte, small additions of arsenic, lead, sulfur and selenium and conditions of electrolysis. Tables, graphs. 35 ref. (L17, AY)

493-L. (German.) **Thickness of Nickel Deposits on Iron by Dissolution Process.** Gerhard Schikorr. *Metalloberfläche,* Ausgabe B, v. 6, no. 4, Apr. 1954, p. 49-51.

Principles of anodic and chemical dissolution processes with and without prime coatings. Tables. 6 ref. (L19, Ni, Fe)

494-L. (German.) **Use of Hull Cell for Testing and Controlling Electrolytic Baths.** E. Gerber. *Metalloberfläche,* Ausgabe B, v. 6, no. 4, Apr. 1954, p. 51-53.

Principle, design and use of cell as means of testing current density of electrolytic baths and quality of deposits. Diagrams, graphs, table. 1 ref. (L17)

495-L. (German.) **Determinations of Fluosilicic and Hydroboric Acid and Organic Compounds in Electrolytic Baths.** Fred Karsten. *Metalloberfläche,* Ausgabe B, v. 6, no. 4, Apr. 1954, p. 53-55.

Methods of determining and controlling electrolytes including wetting agents. 2 ref. (L17, S11)

496-L. (German.) **Adhesiveness of Electrolytic Deposits.** Fritz Sautter. *Metalloberfläche*, Ausgabe B, v. 6, no. 4, Apr. 1954, p. 55-57.

Ollard, Knapp, Schlaupitz and Robertson's methods of testing. Attempts to eliminate extraneous factors such as tensile strength and thickness of deposit which tend to mask true results. Diagrams. 6 ref. (L17)

497-L. (German.) **Methods of Measuring pH and rH in the Treating Industry.** H.-D. Schulz-Methke. *Metalloberfläche,* Ausgabe A, v. 8, no. 4, Apr. 1954, p. 61-64.

Importance and principles of measuring H ion concentration and redox potentials of electrolytes. Present status of equipment. Photograph, diagrams. (To be concluded.) (L17)

498-L. (Japanese.) **Studies on the Addition Agents Applied to the Electrodeposition of Metals. I. The Addition Agents Applied to the Electrodeposition of Copper From the Copper Sulphate Solution. II. Influence of Electrolytic Conditions Upon the Action of the Addition Agents.** Minoru Kikuchi and Harukazu Toyoda. *Reports of the Government Chemical Industrial Research Institute, Tokyo,* v. 49, no. 1, Jan. 1954, p. 31-38.

Experimental results. Tables, graphs. 10 ref. (L17, Cu)

499-L. (Japanese.) **Alkaline Degreasing of Metal Surface.** Minoru Kikuchi and Kikuma Oki. *Reports of the Government Chemical Industrial Research Institute, Tokyo,* v. 49, no. 2, Feb. 1954, p. 61-64.

Alkaline degreasing solutions were mixed with surface active agents (ionic or nonionic). Surface tensions of solution were lowered. Degreasing action was increased by mixing with nonionic surface active agent. Diagrams, graphs. 1 ref. (L12)

500-L. (Japanese.) **Addition of Surface Active Agents to the Nickel Plating Bath. I. Pin Holes of the Plated Nickel. II. Properties of the Baths.** Minoru Kikuchi and Kikuma Oki. *Reports of the Government Chemical Industrial Research Institute, Tokyo,* v. 49, no. 2, Feb. 1954, p. 65-71.

Three kinds of agents were added to low and high-pH nickel baths. Hydrogen overvoltage of bath measured with Haring cell was increased by addition of agent. Tables, graphs. 4 ref. (L17, Ni)

501-L. (Russian.) **Mechanism of Electrodeposition Process of Chromium.** A. I. Levin, A. I. Falicheva, E. A. Ukshe and N. S. Brylina. *Doklady Akademii Nauk SSSR,* v. 95, no. 1, Mar. 1, 1954, p. 105-109.

Investigation of platinum, chromium, nickel, silver, copper and zinc cathodes for dependence of current strength on the potential. Graphs. 12 ref. (L17, Cr)

502-L. (Russian.) **Investigation of Certain Liquid Greases for Protection of Steel During Exploitation and Storage.** V. V. Skorchelletti and V. E. Piskorskii. *Zhurnal Prikladnoi Khimii,* v. 27, no. 3, Mar. 1954, p. 314-318.

Addition of montan wax gave best results. Graphs, tables. 5 ref. (L26, ST)

503-L. (Book.) **Corrosion and Temporary Protectives.** 87 p. 1952. Shell-Mex House, Strand, London, W.C. 2.

Part I. Survey of mechanism of electrochemical attack. Part II: Account of petroleum-base temporary protective coatings; their selection, application and removal. (L26, R1)

504-L. (Book.) **Symposium on Porcelain Enamels and Ceramic Coatings as Engineering Materials.** 122 p. 1954. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $2.50.

Includes "Introduction", Dwight G. Bennett; "Some Examples of the Functional Use of Porcelain Enamel and Ceramic Coatings for Steel", G. H. Spencer-Strong; "Resistance of Porcelain Enamels to Weathering", Dwight G. Moore; "The Chemical Resistance of Glass Fused to Steel", E. A. Sanford and O. J. Britton; "Acid Resisting Properties of Porcelain Enamels", Harold C. Wilson; "Requirements for and Expected Benefits From the Application of Coatings to High-Temperature Components of a Jet Engine", A. C. Francisco and G. M. Ault; "High-Temperature Ceramic Coatings as Applied to Aircraft Power Plants", B. L. Paris; "The Industrial Processing of High-Temperature Ceramic Coatings", J. H. Terry; "The Abrasion Resistance of Various Types of Porcelain Enamel", Arthur V. Sharon; "The Resistance of Porcelain Enamels to Surface Abrasion as Determined by the PEI Test", John T. Roberts; "Torsion Testing as an Aid to the Porcelain Enamel Industry", E. L. Hoover; "The Strengthening Effect of Porcelain Enamel on Sheet Iron as Indicated by Bending Tests", E. E. Bryant; "Tension Tests of Porcelain Enameled Steel", W. A. Deringer; "Effect of Temperature on the Electrical Resistivity of Several Ceramic and Silicone-Type Coatings", Simon W. Strauss, Lloyd E. Richards, and Dwight G. Moore; "A Laboratory Evaluation of Ceramic Coatings for High Temperature Applications", Sara J. Ketcham; and "Guideposts in Selecting Porcelain Enamels and Ceramic Coatings. A Summary", W. N. Harrison. (L27)

505-L. (Book—German.) **Metal Surface Processing and Treatment Yearbook. (Jahrbuch der Obereflaechentechnik).** Phil. W. Wiederholt, editor. 10th Ed. 800 p. 1954. Metall Verlag G.m.b.H., Grunewald, Hubertusallee 18. Berlin, Germany. 5.40 DM.

General review of surface treatment techniques; measurement of hardness, brightness, roughness, and thickness; and new patents and processes. (L general, Q29, S14, S15)

506-L. Porcelain Enameled Aluminum, a Competitive Product. II. D. R. Goetchius. *Ceramic Industry,* v. 62, May 1954, p. 72-73, 103.

Enameling processes, details of costs as compared with enameling on steel and relative merits as a competitive item. Photographs. (L27, Al)

507-L. Electrodeposition of Copper From the Triethanolamine Bath. T. L. Rama Char and N. B. Shivaraman. *Indian Institute of Science, Journal,* v. 36, sec. A, Apr. 1954, p. 111-116.

Plating on steel from solutions containing copper oxalate, nitrate, citrate, tartrate and carbonate which do not deposit copper by immersion. Tables. 11 ref. (L17, Cu, ST)

508-L. Low Temperature Enamels and Their Application to Aluminium. *Industrial Finishing (London),* v. 6, Apr. 1954, p. 630-634.

Advantages of various compositions. Conditions to be satisfied in preparation. 21 ref. (L27, Al)

509-L. Sealing Metal Surfaces With Resins. A. E. Williams. *Industrial Finishing (London),* v. 6, Apr. 1954, p. 635-641.

Ethoxyline resins offer good surface protection for magnesium, aluminum, bronze and ferrous metals. Photographs, tables. (L26, Mg, Al, Cu, ST)

510-L. Better Properties Extend Uses for Porcelain Enamels. W. A. Barrows. *Iron Age,* v. 173, May 13, 1954, p. 121-124.

Problems involving heat, corrosion, thermal shock and other service conditions are being solved. On cold rolled steel, coatings stand repeated shocking from 1000 to 60° F. Industrial enamels resist sulfuric and muriatic acids. Photographs, table. (L27)

511-L. Finishing Supplement. The British Electro-Plating Industry. H. Silman. *Metal Industry,* v. 84, Apr. 30, 1954, p. 349-352.

Improvements in plant and equipment; new methods of construction to reduce maintenance costs. Table, micrograph, photographs, diagrams. (L17)

512-L. The Effect of Chromate Films on the Corrosion Resistance of Hot Dip Galvanize in Brine. Frank J. Bubsey. *Metal Progress,* v. 65, May 1954, p. 122-124.

Beneficial lowering of corrosion. Method is simple and economical. Graphs, table, photograph. (L14, L16, CN)

513-L. New Zinc-Rich Paint Gives Real Rust Protection. *Power Engineering,* v. 58, May 1954, p. 87.

Electrochemical action enables new coating to give metals same protection as galvanizing. Diagram. (L26, Zn)

514-L. They're Using a New Method to Bond Steel to Aluminum. *Precision Metal Molding,* v. 12, May 1954, p. 49-50.

Stainless steel stampings prebonded by immersion in molten aluminum. Photographs. (L22, Al, ST)

515-L. (French.) **Poisoning of a Platinum-Platinum Electrode by Small Quantities of Electrolytically Deposited Cadmium.** Maurice Bonnemay. *Comptes rendus,* v. 238, no. 14, Apr. 5, 1954, p. 1512-1513.

Action of cadmium deposited in a cadmium sulfate and sulfuric acid bath. (L17, Cd)

516-L. (French.) **Electrolytic Tinning.** J. P. Gustin. *Metallurgia italiana,* v. 46, no. 2, Feb. 1954, p. 54-61.

Characteristics and fields of application of various processes. Diagrams, photographs. (L17)

517-L. (German.) **Experimental Investigation in Metal Spraying.** A Matting and K. Becker. *Schweissen und Schneiden,* v. 6, no. 4, Apr. 1954, p. 127-142.

Photographic study of process within the nozzle. Table, photographs, graphs, diagrams. 57 ref. (L23)

518-L. (German.) **The Behavior of Zinc Anodes in Cyanide Baths.** Willi Machu, A. M. Azzam and G. M. Habashi. *Werkstoffe und Korrosion,* v. 5, no. 4, Apr. 1954, p. 129-136.

Stable surface layer formed as result of reciprocal action of electrolytes. Passive zinc anodes show highest degree of polarization. Graphs, tables. 5 ref. (L17, Zn)

519-L. (German.) **Protective Lead Paint Coatings.** Oscar Neuss. *Werkstoffe und Korrosion,* v. 5, no. 4, Apr. 1954, p. 139-140.

Weathering tests substantiate protective value compared with oil-base paints. (L26)

520-L. (Italian.) **Cold and Anodic Oxidation of Cadmium. Researches on the Film Structure.** G. Bianchi. *Metallurgia italiana,* v. 46, no. 2, Feb. 1954, p. 49-53.

Investigation on nature and relationship of orientation of films with the base metal. Micrographs, tables, diffraction patterns. 8 ref. (L19, M26, Cd)

521-L. (Russian.) **Surface Activity of Phenols and Amines on Zinc and Lead Electrodes.** G. Z. Kir'iakov. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1097-1099.

Influence of organic compounds on kinetics of electrode processes and as depositing substance during electrolysis of acid solutions of lead sulfamate and zinc sulfate. Graphs. 3 ref. (L17, Pb, Zn)

522-L. (Russian.) **Chromium Plating of Cutting Tools.** M. I. Andrianov. *Stanki i Instrument,* v. 25, no. 2, Feb. 1954, p. 21-23.

Preparation of surface before plating. Diagrams. (L14, Cr, TS)

523-L. (Russian.) **Problem of Porosity in Electroplating.** L. S. Sapiro. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 1, Jan. 1954, p. 26-29.

Formation of gas bubbles on cathode and control measures. Diagrams. 8 ref. (L17)

524-L. (Russian.) **Influence of Thiocarbamide on Electrocrystallization of Copper.** L. I. Antropov and S. Ia. Popov. *Zhurnal Prikladnoi Khimii,* v. 27, no. 1, Jan. 1954, p. 55-63.

Cathodic and anodic polarization in acid copper baths. Graphs, micrographs. 33 ref. (L17, Cu)

525-L. (Russian.) **Potentials of Separation of Nickel and Theory of Retarded Ion Discharge.** A. L. Rotinian, V. Ia. Zel'des, E. Sh. Ioffe and E. S. Kozich. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 1, Jan. 1954, p. 73-80.

Cathode yields as function of pH at various concentrations of sodium chloride in the electrolyte. Graphs. 24 ref. (L17, Ni)

526-L. (Russian.) **Mechanism of Effect of Surface-Active Substances on Electrodeposition of Metals.** A. I. Levin, E. A. Ukshe and V. S. Kolevatova. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 1, Jan. 1954, p. 116-126.

Position of null point of the metal influences change of equilibrium potentials. Tables, graphs. 19 ref. (L17)

527-L. (Russian.) **Influence of Potassium Ions on Electrodeposition of Copper.** S. V. Gorbachev and R. M. Vasenin. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 1, Jan. 1954, p. 135-146.

Polarization of copper electrode, current density and activation energy of conductivity. Graphs, diagrams. 21 ref. (L17, Cu)

528-L. (Russian.) **Dispersibility of Complex Copper Electrolytes Containing Enthanolamines.** A. V. Izmailov and S. V. Gorbachev. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 2, Feb. 1954, p. 229-235.

Effect of amount of addition, temperature, energy of activation and electrode potential. Graphs, diagrams. 6 ref. (L17, Cu)

529-L. (Russian.) **Dispersibility of Complex Copper Electrolytes Containing Sodium Pyrophosphate.** S. V. Gorbachev and A. V. Izmailov. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 2, Feb. 1954, p. 236-239.

Effects of various concentrations on distribution of metal on the carbon cathode. Graphs. 3 ref. (L17, Cu)

530-L. (Swedish.) **Reconditioning Worn Drills by Hard-Surfacing.** Tage Larsson. *Svetsaren,* v. 18, no. 4, 1953, p. 55.

Welding procedure. Photographs. (L24, TS)

531-L. Rusty Stock Recelaimed. C. N. Calvin. *Bureau of Ships Journal,* v. 3, May 1954, p. 32-34.

Six minutes in "Tumblast" and unfit-for-issue stock looks brand new. Photographs. (L10)

532-L. Internal Coating of Pipe in Place. M. B. Grove. *Corrosion,* v. 10, May 1954, p. 142-146.

Procedures and results of plastic coating inside of old aluminum, steel and new steel pipe. Diagram. (L26, Al, ST)

533-L. Effects of Addition Agents on the Cathode Polarization Potential During the Electro-Deposition of Copper. L. L. Shreir and J. W. Smith. *Faraday Society, Transactions,* v. 50, Apr. 1954, p. 393-403.

Includes graphs, tables. 15 ref. (L17, Cu)

534-L. One-Coat White Enamel. J. Semple. *Foundry Trade Journal,* v. 96, May 6, 1954, p. 533-537.

Characteristics and composition of material. Effect of super-opaque enamels on plant and material utilization. Graphs. (L27)

535-L. Plating Setup Recycles Propellers for Proper Balance. C. B. Conwell and C. J. Stansfield. *Iron Age,* v. 173, May 20, 1954, p. 133-135.

New zinc-plating installation speeds operation 30 to 50%; deposits are more consistent. Photographs, diagram. (L17, Zn)

536-L. Sprayed Metals. D. A. Watson. *Machine Design,* v. 26, May 1954, p. 166-170.

Basic characteristics of present-day process, end results to be expected. Photographs, tables. (L23)

537-L. Prefinished Metals. C. P. Stewart. *Machine Design,* v. 26, May 1954, p. 174-176.

Characteristics and applications of preplated metals. Photographs, table. (L17, Cr, Ni, ST, Cu, Zn, Al)

538-L. Precious-Metal Laminates. W. Channing and G. H. Barney. *Machine Design,* v. 26, May 1954, p. 180-183.

Bonding of precious metals to copper alloy base metals by heat and pressure, to give desirable electrical properties and corrosion resistance. (L22, EG-c, Cu)

539-L. Stop-Offs in Hard Chrome Plating. Arthur W. Logozzo. *Metal Finishing,* v. 52, May 1954, p. 56-60.

Tools, methods and materials, use of lead foil and plastic sheet. Photographs. (L17, Cr)

540-L. Surface Treatment and Finishing of Light Metals. II. Corrosion and Protection of Aluminum. S. Wernick and R. Pinner. *Metal Finishing,* v. 52, May 1954, p. 71-77.

Protection by metal spraying and oxide films. Properties of various coatings. Tables, photograph. 68 ref. (L23, L14, Al)

541-L. The Efficiency of Some Protective Treatments in Preventing the Oxidation of Mild Steel at High Temperatures. A. H. Sully, E. A. Brandes and R. H. Brown. *Metallurgia,* v. 49, no. 294, Apr. 1954, p. 165-168.

Effectiveness of chromizing, aluminum coating or enameling steel to protect it against oxidation when heated to 700° C. for 1000 hr. Tables, graphs. 2 ref. (L14, L27, CN)

542-L. How to Clean Titanium Sheet for Spot Welding. E. R. Funk. *Modern Metals,* v. 10, May 1954, p. 70, 72-73.

Effective descaling procedure. Diagram, graph, photograph. (L10, K3, Ti)

543-L. Impermeable Organic Coatings. F. S. Stewart. *Organic Finishing,* v. 15, May 1954, p. 8-10.

Mechanism of drying, indications of impermeability and chemical resistance of certain single layer films. Graph, photographs. (L26)

544-L. Continuous Strip Galvanizing in Argentina. C. R. W. Hughes. *Sheet Metal Industries,* v. 31, no. 325, May 1954, p. 359-366.

Modernization effected; operation of plant. Photographs. (L16, Zn)

545-L. Plating Nickel on Aluminum. Sam Baker. *Steel,* v. 134, May 24, 1954, p. 115-116.

New system gives better resealing qualities on hermetically sealed parts. Tables, photographs. (L17, Al, Ni)

546-L. The Applications of Blast Cleaning in Steel Processing. III. Victor F. Stine. *Steel Processing,* v. 40, May 1954, p. 307-311.

Nonmetallic and metallic abrasives with production equipment used for testing cleaning methods. Photographs. (L10)

547-L. (Czech.) **Burning Out Defects in Steel Castings by Carbon Electrode.** Karel Maly. *Slévarenstvi,* v. 2, no. 2, Feb. 1954, p. 51-53.

Mechanical cleaning in preparation for welding of defects. Efficiency of method. Photographs. (L10, K general, CI)

548-L. (French.) **Electrolytic Deposits of Tin Alloys.** J. W. Cuthbertson.

Metallurgia italiana, v. 46, no. 3, Mar. 1954, p. 85-90.

Experiments on zinc, copper, nickel, cobalt and antimony alloys of tin. (L17, Sn, Zn, Cu, Ni, Co, Sb)

549-L. (French.) **Enamelling of Light Metals With Vitrified Enamel. II.** F. J. Biechler, J. J. Meynis de Paulin. *Revue de l'Aluminium,* v. 31, no. 209, Apr. 1954, p. 135-318.

Preparation of metal and enamel, cause of defects. 4 ref. (L27, Al)

550-L. (French.) **Application of Hard Chrome Plating to Aluminum and Its Alloys.** Charles Etienne. *Revue de l'Aluminium,* v. 31, no. 209, Apr. 1954, p. 139-143.

Friction properties, surface hardness, abrasion resistance and resistance to alkaline solutions. Tables, graph, photographs. 3 ref. (L17, Q9, Q29, Cr, Al)

551-L. (German.) **Status of Varnish and Paint Techniques in the Field of Protection Against Corrosion.** G. Sprock. *Fette, Seifen, Anstrichmittel,* v. 56, no. 4, Apr. 1954, p. 238-241.

Protective effects, compositions, properties of basic raw materials. Tables. (L26)

552-L. (German.) **Electropolishing With Rectified Current.** J. Steiner. *Metalloberfläche,* Ausgabe B, v. 6, no. 5, May 1954, p. 65-69.

Results on copper, brass, stainless steel and aluminum in different electrolytes. Graphs, diagrams, photographs. 6 ref. (L13, Cu, Zn, SS, Al)

553-L. (German.) **Crack-Free Chromium Deposits.** Heinz W. Dettner. *Metalloberfläche,* Ausgabe B, v. 6, no. 5, May 1954, p. 69-73.

Increased corrosion resistance and improved polishing properties. Micrographs, tables. 20 ref. (L14, Cr)

554-L. (German.) **Further Development of Metal Spraying Technique.** Hans Reininger. *Metalloberfläche,* Ausgabe B, v. 6, no. 5, May 1954, p. 73-75.

Literature review. Desirable and undesirable effects of oxides in structure of coatings. Tables, micrographs. 23 ref. (L23, Fe, Zn)

555-L. (German.) **The Application of Enamel.** Rudolf Märker. *Silikat Technik,* v. 5, no. 3, Mar. 1954, p. 136-138.

Proper application on different types of ware. Table. 2 ref. (L27)

556-L. (Russian.) **Investigation of Thin Coatings of Protective Greases for Preservation of Steel Objects.** V. V. Skorchelletti, A. I. Bukhbinder and V. E. Piskorskii. *Zhurnal Prikladnoi Khimii,* v. 27, no. 4, Apr. 1954, p. 454-456.

Effectiveness of grease containing aluminum oleate. Tables. 1 ref. (L26, ST)

557-L. **Ionic Mass Transfer and Concentration Polarization at Rotating Electrodes.** M. Eisenberg, C. W. Tobias and C. R. Wilke. *Electrochemical Society, Journal,* v. 101, June 1954, p. 306-319.

Transfer rates at nickel electrodes rotating about their axes in center of stationary electrodes were studied using ferri-ferrocyanide couple in alkaline solutions. Photographs, diagram, graphs, tables. 48 ref. (L17, Ni)

558-L. **The Nature of the Zinc-Containing Ion in Strongly Alkaline Solutions.** Thedford P. Dirkse. *Electrochemical Society, Journal,* v. 101, June 1954, p. 328-331.

Electrode potentials of zinc in solutions under equilibrium conditions were measured by potentiometric method. Graphs. 6 ref. (L17, Zn)

559-L. **Let's Hard Face It!** Harvey S. Miller. *Industry & Welding,* v. 27, June 1954, p. 41-44, 82-83.

Economies, equipment and facts to consider in hard facing. Photographs. (L24)

560-L. **Metallic Coatings on Steel.** D. L. Phillips. *Iron and Steel Institute; Papers of the Affiliated Local Societies, Special Report no.* 49, Feb. 1954, p. 1-8 + 4 plates.

Investigations of application and properties of coatings. Graph, diagram, micrographs. (L general, ST)

561-L. **Government Finishing Specifications.** N. E. Promisel and David M. Promisel. *Metal Finishing,* v. 52, May 1954, p. 61-70.

An explanation and digest relating to metal coatings and surface treatments other than organic coatings. (To be continued.) (L general, S22)

562-L. **The Blast Cleaning of Metal Surfaces.** Victor F. Stine. *Metal Progress,* v. 65, June 1954, p. 104 + 6 pages.

Sand, wet sand, shot, grit, hydrosand and liquid blasting. Photographs. (L10)

563-L. **Metal Cleaning.** K. G. Lewis. *Metal Treatment and Drop Forging,* v. 21, May 1954, p. 207-214.

Removal of scale from forgings. Micrographs, diagram. 42 ref. (To be continued). (L10)

564-L. (Russian.) **Problem of Electrolytic Separation of Light Metals Out of Anhydrous Solutions at Ordi-**

nary Temperatures. D. A. Pospekhov. *Zhurnal Prikladnoi Khimii,* v. 27, no. 5, May 1954, p. 552-557.

Catalytic reactions carried out in halide solutions. 57 ref. (L17, Al)

565-L. (Book.) **Handbook of Industrial Electroplating.** E. A. Ollard and E. B. Smith. 364 p. 1954. Iliffe and Sons, Ltd., London. 31s. 2d.

Design, erection, and operation of electrodeposition plant. Testing and maintenance of plating solutions. (L17)

566-L. (Book.) **Specifications and Tests for Electrodeposited Metallic Coatings.** 96 p. 1953. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $1.85.

Jointly prepared with American Electroplaters Society. Various procedures included. (L17, S22)

567-L. (Book.) **Study of Hard Coating for Aluminum Alloys. Wright Air Development Center.** Report No. PB 111320. 121 p. 1953. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $2.00.

High resistance to abrasion but serious lowering of fatigue strength of the parent metal are effects of hard oxide coatings.
(L14, Q7, Q9, Al)

568-L. Preparation of Metal Surfaces for Industrial Finishes. R. C. Gibson. *American Paint Journal,* v. 38, June 21, 1954, p. 28 + 5 pages.

Thorough cleaning of surface to remove foreign material followed by chemical coating treatment are prerequisites to obtaining satisfactory paint performance. 7 ref.
(L10, L12, L14)

569-L. Effect of Gelatin on the Changes in Initial Cathode Polarization During Electrodeposition of Copper. B. I. Parsons and C. A. Winkler. *Canadian Journal of Chemistry,* v. 32, June 1954, p. 581-590.

Effects of chloride and gelatin studied by means of a cathode-ray oscilloscope. Graphs. 7 ref.
(L17, Cu)

570-L. Protective Coatings for Ships and Marine Installations. J. C. Hudson. *Chemistry & Industry,* 1954, no. 23, June 5, p. 640-651.

Main types of coatings for protection against atmospheric, sea water and soil corrosion. Photographs, graphs, diagrams. 21 ref. (L general)

571-L. Aluminizing of Steel. A. N. Kapoor, A. B. Chatterjea and B. R. Nijhawan. *Journal of Scientific & Industrial Research* v. 13, sec. 13B, Apr. 1954, p. 286-291.

Two-stage process consisting of prior treatment in halide flux bath followed by hot dip in aluminum bath. Tables, micrographs, graph, diagram. 16 ref. (L16, Al, CN)

572-L. Applied Finishes for Aluminium Alloy Die Castings. H. K. Barton and L. C. Barton. *Machinery (London),* v. 84, May 28, 1954, p. 1143-1148, 1153-1154.

Preplating, anodizing, chemical conversion and surface treatments. Tables, photographs, diagram, graph. (L general, Al)

573-L. Where and When to Use Electropolishing. Malcolm W. Riley. *Materials & Methods,* v. 39, June 1954, p. 104-106.

Application for final finish or as preplating operation. Tables, photographs. (L13, SS)

574-L. Conditions for Electrolytic Polishing of Metals and Alloys. S. H. Bush. *Materials & Methods,* v. 39, June 1954, p. 137, 139, 141.

Electrolyte composition, current density, voltage, temperature and time. Table. 57 ref. (L13)

575-L. Plastic Liners for High-Pressure Pipelines. R. G. Deering. *Oil and Gas Journal,* v. 53, June 14, 1954, p. 120-122.

Thin-wall butyrate tubing is latest weapon against internal corrosion. Photographs. (L26)

576-L. How Good Must Pipeline Coating Be? L. G. Sharpe. *Oil and Gas Journal,* v. 53, June 14, 1954, p. 130-132.

Data indicate that optimum costs are attained with a reasonably well-coated line which can be cathodically protected with moderate current quantities. Photograph, table.
(L general, R10, ST)

577-L. Management Problems of the Metal Finishing Shop. Bruce E. Warner. *Plating,* v. 41, June 1954, p. 646-648.

Financial, organizational and employee problems. (L general, A6)

578-L. Bright Nickel Process Simplifies Bumper Manufacture. Robert D. Miller. *Products Finishing,* v. 18, June 1954, p. 24-30, 32.

Production of finishes to withstand scuffing, abrasion, traffic wear-and-tear and corrosive effects of weather and road clearing chemicals. Photographs. (L17, Ni)

579-L. Automotive Paint Processes and Equipment. R. E. VanDeventer. *Products Finishing,* v. 18, June 1954, p. 40 + 8 pages.

Surface preparation, primer and color coat application. (L26)

580-L. Tin Immersion Coating. C. Fred Gurnham. *Products Finishing,* v. 18, June 1954, p. 74 + 9 pages.

Hot dipping, electroplating, and immersion processes on aluminum and steel wire. Table. (L16, L17, Sn, Al, ST)

581-L. Pushbutton Water Demineralization Accelerates Tinplate Production. John K. Sargent and J. W. Stewart. *Steel,* v. 134, June 7, 1954, p. 114, 117, 120.

Automatic system that turns out 7,000,000 gal. of clarified and 1,000,000 gal. of demineralized water every day. Photographs. (L17)

582-L. Special Property Nickel Plate. *Steel,* v. 134, June 21, 1954, p. 135.

Low-tensile and compressive stress characteristics, hardness and wear resistance of nickel sulfamate bath deposits. Table, graph. (L17, Q general, Ni)

583-L. The Plurial Process. M. Lebrun. *Welding and Metal Fabrication,* v. 22, June 1954, p. 228, 229-231.

Development, principles and use of bundled electrodes for hard facing. Tables, photographs, oscillogram. (L24, ST)

584-L. Mechanical Process for Porous Chromium Plates. G. S. Samoilovich and N. G. Andreev. *Henry Brutcher, Altadena, Calif., Translation no.* 3090, 5 p. (From *Vestnik Mashinostroeniya,* v. 32, no. 11, 1952, p. 49-52.)

Knurling process for impressing small but relatively deep holes into surface of engine liners to be plated. Photographs, diagrams, micrographs. (L14, G12, Cr)

585-L. Recent Methods for the Protection of Zinc and Tin. H. Anders. *Henry Brutcher, Altadena, Calif., Translation no.* 3095, 5 p. (From *Werkstoffe und Korrosion,* v. 3, no. 12, 1952, p. 460-461.)

Chemical methods of surface protection of zinc involving the production of chromate coatings. Protection of tin surfaces by anodic oxidation in dilute ammonia solutions and anodic blackening of tin and tin alloys with solutions containing phosphates or ferricyanides. 3 ref. (L14, L19, Sn, Zn)

586-L. Tinning and Soldering of Aluminum by Ultrasonics. P. Wenk and H. Boljahn. *Henry Brutcher, Altadena, Calif., Translation no.* 3231, 6 p. (Slightly condensed from *Zeitschrift für Metallkunde,* v. 43, no. 9, 1952, p. 322-324.)

Previously abstracted from original. See item 974-L, 1952. (L16, K7, Al)

587-L. (French.) **Galvanization of Tubes.** H. Bablik. *Métallurgie et la construction mécanique,* v. 86, no. 5, May 1954, p. 433, 435, 437, 439.

Installation improvements, surface preparation, fluxes and base metal. Micrographs, tables, photograph. (L16, Zn)

588-L. (French.) **Surface-Active Materials. New Resources for the Engineer.** José de Launoit and Henry Jungels. *Revue universelle des mines,* v. 10, ser. 9, no. 4, Apr. 1954, p. 92-96.

Application for pickling, corrosion inhibition and drawing compounds. (L12, R10, G21)

589-L. (German.) **Electrolytic Deposition of Silver From Solutions of Simple Salts.** H. M. Heiling. *Metall,* v. 8, nos. 11-12, June 1954, p. 438-448.

Influence of inhibition, current density, temperature, anions and silver concentration. Diagrams, micrographs; tables. 27 ref. (L17, Ag)

590-L. (Italian.) **Finishing of Light-Alloy Pistons.** A. Prati and F. Sacchi. *Alluminio,* v. 23, no. 2, Mar. 1954, p. 139-144.

Leading, tinning and graphitization. Micrographs, photographs. 8 ref. (L16, Al, Pb, Sn)

591-L. (Italian.) **Tin as a Coating Material.** G. Bianchi. *Metallurgia italiana,* v. 46, no. 4, Apr. 1954, p. 141-149.

Reactions accompanying corrosion of tin-coated iron and copper. Graph, tables. 19 ref. (L16, L17, Sn, Fe, Cu)

592-L. (Swedish.) **Electroformed Hard Nickel Alloy Molds.** P. Spiro. *Svenska Plast Föreningen Tekniska Meddelanden,* v. 9, no. 7, Apr. 1954, 13 p.

Production, properties and finishing of master molds. Diagrams. (L18, T5, Ni)

593-L. Gaps in Cathodic and Anodic Coatings on Steel. Corrosive and Protective Effects. U. R. Evans. *British Steelmaker,* v. 20, June 1954, p. 206-209.

Electrochemical phenomena at gaps when surface is wet with a corrosive liquid. Diagram. 13 ref. (L19, L21, ST)

594-L. Metallizing May Be for You. Howard Vanderpool. *Chemical Engineering,* v. 61, July 1954, p. 189-194.

Equipment and techniques for metallizing. Metallizing systems. Applications in chemical processing equipment. Photographs, diagram. (L23)

595-L. Thermostatic Control in Electroplating. Leo Walter. *Electroplating and Metal Finishing,* v. 7, June 1954, p. 212-214.

Basic factors, effect of process and control time lags, choice of equipment. (L17)

596-L. Cleaning and Conditioning Metal Surfaces for Coatings. P. C. Bardin. *Industrial Finishing,* v. 30, June 1954, p. 30 + 14 pages.

Acid solution, steam spray and manual washing, solvent vapor and thermal degreasing, blast and ultrasonic cleaning. Phosphate coatings. Photographs. (L12, L10, L14)

597-L. Engineered Finishing System Meets Difficult Requirements. P. C. Bardin. *Industrial Finishing,* v. 30, June 1954, p. 58 + 5 pages.

System for applying white enamel by flow coating on a food waste disposer. Photographs. (L27)

598-L. Molybdenum Coatings Expand Uses of Metallizing. A. P. Shepard. *Iron Age,* v. 174, July 1, 1954, p. 105-107.

Coatings provide a surface material with good wear resistance as well as a bonding coat for other metals. Photographs. (L23, Mo)

599-L. System Engineering for Continuous Strip Processing Lines. J. S. Apperson. *Iron and Steel Engineer,* v. 31, June 1954, p. 68-74; disc., p. 74-76.

Electrical system for electrolytic tinning line. Photographs, diagrams, graph. (L17, Sn)

600-L. Sputtering at Low Ion Velocities. Gottfried Wehner and Gustav Medicus. *Journal of Applied Physics,* v. 25, June 1954, p. 698-702.

Low-sputtering rates measured by probe technique in a plasma. Determination of threshold voltage. Diagram, graphs. 4 ref. (L25, Pt)

601-L. Reclaiming Overmachined Parts With Electroless Plating. Frank Charity. *Machine and Tool Blue Book,* v. 49, July 1954, p. 132-134, 136.

Baths, operating procedures, advantages and limitations. Photographs, table. (L14, Ni)

602-L. Loss of Aluminium From Galvanising Baths. N. B. Rutherford. *Metal Treatment and Drop Forging,* v. 21, June 1954, p. 261-267.

Means for reducing loss and method of calculating additions needed. Tables, graphs. 26 ref. (L16, Al, Zn)

603-L. The Aldip Process for Coating Steel With Aluminum. *Modern Metals,* v. 10, June 1954, p. 66, 68.

Produces a tight, nonrusting, heat resistant coating on iron and steel surfaces. Photographs, diagram. (L16, Al, CN)

604-L. A Survey of Metal Surface Soils and Their Removal. Edward Engel. *Organic Finishing,* v. 15, June 1954, p. 18-23.

Methods of removing cutting oils and drawing, forming, and buffing compounds. Tables. (L10)

605-L. Effect of Surface Finishing of Nonferrous Base Metals on the Protective Value of Plated Coatings. George J. Kahan, W. W. Macchia and J. M. Fairbank. *Plating,* v. 41, June 1954, p. 649-652.

Six finishing methods on rolled brass with protective finishes of bright nickel and chromium. Micrographs. (To be continued.) (L general, Cr, Cu, Ni)

606-L. Control of Radiant Heat by Surface Finish. R. M. Leedy. *Westinghouse Engineer,* v. 14, July 1954, p. 147-151.

Effect of various coatings on emissivity. Tables, graphs, photographs, diagrams. 15 ref. (L general, P17)

607-L. Porcelain Enamel Fights Corrosion. W. A. Barrows. *Power,* v. 98, July 1954, p. 111-113, 220.

Advantages of coating on boiler tubes, pump impellers, coal screws, heat exchangers, thermocouple shields, smokestacks, breechings and induced-draft fans. Photographs. (L27)

608-L. Protection of Iron and Steel by Thermally Produced Oxide Coatings ('Thermoxyd' Process). E. Fenner and L. Koch. *Henry Brutcher, Altadena, Calif., Translation no.* 3184, 9 p. (From *Archiv für Metallkunde,* v. 2, no. 2, 1948.)

Previously abstracted from original. See item 7B-99, 1949. (L14, CI, ST)

609-L. Surface Layers of High-Melting Titanium Compounds. A. Münster and W. Ruppert. *Henry Brutcher, Altadena, Calif., Translation no.* 3249, 14 p. (From *Zeitschrift für Elektrochemie,* v. 57, no. 7, 1953, p. 564-571.)

Previously abstracted from original. See item 8-L, 1954. (L25, Ti, Fe)

610-L. Role of Nickel Dip in Enameling of Sheet Steel. D. G. Moore, J. W. Pitts and W. N. Harrison. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3207, June 1954, 27 p.

Effects of firing time and weight of nickel deposited from the nickel-dip solution on the adherence developed by a cobalt-free and a cobalt-bearing ground-coat. Graphs, tables, micrographs. 19 ref. (L16, L27, Fe, CN)

611-L. Electroplated Coatings. J. M. Hosdowich. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 41-55.

Review of application and properties of chromium and nickel plate. Photographs, tables. 13 ref. (L17, Cr, Ni)

612-L. Anodized Coatings. J. M. Hosdowich. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 56-62.

Review of application and properties on aluminum, magnesium and zinc. Photograph. 7 ref. (L19, Al, Mg, Zn)

613-L. Diffusion Treatments for Wear Protection. M. B. Bever and C. F. Floe. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 120-130.

Chromizing and siliconizing. Processes, reactions and structure of cases. 21 ref. (L15, Cr, Si, ST)

614-L. Metallizing. Howard Vanderpool and A. P. Shepard. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 131-153.

Equipment and processes. Properties of coatings. Applications of metallized parts in equipment subjected to severe wear. Table, photographs. (L23)

615-L. Hard Facing. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 163-173.

Review of methods, materials and equipment. Tables, photographs. 3 ref. (L24)

616-L. Hard Facing Alloys. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 174-179.

Classification and structure. Criterions for selection. Tables. (L24)

617-L. Tungsten Carbide Hard Facing. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 180-190.

Review of materials, processes and equipment. Photographs, micrographs, graphs. 5 ref. (L24, W)

618-L. Chromium Carbide Hard Facing. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 191-201.

Properties of austenitic and hardenable high-chromium hard-facing alloys. Micrographs, graph, tables. 8 ref. (L24, Cr)

619-L. Austenitic Stainless Steels. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 251-261.

Hardness and corrosion resistance of stainless steel overlays. Graphs, tables. 5 ref. (L24, Q29, R general, SS)

620-L. Austenitic Manganese Steels. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 262-273.

Compositions and properties of alloy steels for hard facing and other overlays. Tables, photographs. 4 ref. (L24, Q general, AY)

621-L. Hard Facing for Hot Wear Resistance. T. Gaynor. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 274-289.

Review of welding methods and hard facing alloys. Photographs, tables. 9 ref. (L24)

622-L. Economic Justification of Protective Coatings. Clarence C. Harvey. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 295-304.

Appraisal of coating costs, comparison with cost of atmospheric corrosion. Graphs, tables. (L general, R3)

623-L. Surface Preparation and Pretreatment of Metals Prior to Painting. A. J. Liebman. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 305-345.

Equipment and methods for mechanical, flame, chemical and blast cleaning. Tables, photographs, graphs, diagrams, micrographs. 16 ref. (L26, L10, L12)

624-L. Organic Coating for Normal Services. Arnold J. Eickhoff. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 346-365.

General review of corrosion theory. Performance and economics of paints. Photographs, graphs, tables. 18 ref. (L26, R general)

625-L. Corrosion Prevention by Paint Maintenance in Severe Industrial Atmospheres. Kenneth Tator. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 366-377.

Cost comparisons of painting for appearance versus corrosion protection. Graphs, photograph. 2 ref. (L26)

626-L. Metallizing. H. S. Ingham. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 427-442.

Metallized coating systems, applications and costs. Photographs. (L23)

627-L. Electrodeposited Coatings. Fielding Ogburn. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 443-452.

Review of electroplating procedures, properties of electrodeposits and commercial applications. (L17, Q general, T general)

628-L. (English.) **The Effect of Metal Surface Condition on the Anodic Oxidation of Tantalum.** D. A. Vermilyea. *Acta Metallurgica,* v. 2, no. 3, May 1954 p. 476-481.

On polished sheet, an efficiency of 98% is obtained up to the spark voltage with no change in the character of oxide surface. With rough sheet, apparent efficiencies greater than 100% are observed above a critical voltage depending on the nature of the original metal surface. Graphs, micrographs. 2 ref. (L19, Ta)

629-L. (English.) **The Formation of Anodic Oxide Films on Tantalum in Non-Aqueous Solutions.** D. A. Vermilyea. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 482-486.

Influence of forming solution on film structure and on formation kinetics. Graphs. 1 ref. (L19, Ta)

630-L. (French.) **The Variation of Porosity of Electrolytic Coatings as a Function of Electrolysis Conditions.** René Audubert and Maurice Bonnemay. *Comptes rendus,* v. 238, no. 21, May 24, 1954, p. 2083-2084.

Deposits of chromium on copper. Tables. (L17, Cr, Cu)

631-L. (French.) **Study of Anode Voltage During Electrolytic Polishing.** Philippe Brouillet and Israel Epelboin. *Comptes rendus,* v. 238, no. 22, May 31, 1954 p. 2160-2162.

Anode and contact voltage of layer of anions on surface of metal being polished. 1 ref. (L13, Al, Ni)

632-L. (French.) **Possible Surface Treatments for Pressure Castings.** R. Grunberg. *Métallurgie et la construction mécanique,* v. 86, no. 5, May 1954, p. 395, 397, 399.

Corrosion protection for zinc and light alloys. Graph, photograph, table. (To be continued.) (L general, Zn, Al)

633-L. (German.) **Scraping Method for Finishing of Stamped Parts in Precision Machine Industry.** E. P. Kuhlmann. *Metalloberfläche,* Ausgabe A, v. 8, no. 6, June 1954, p. 85-86.

Method suitable for sheet steel parts 0.5 to 6 mm. thick. Photographs, diagram. (L10, ST)

634-L. (German.) **Hardfacing of Compound Cast Rails.** A. Buchholz. *Schweissen und Schneiden,* v. 6, no. 6, June 1954, p. 238-240.

Composition and strength methods and metallurgical examination. Photographs, micrographs, tables. 2 ref. (L24, ST)

635-L. (German.) **The Influence of Chlorine Ions on the Mechanics of Dissolution of Nickel Anodes in Sulphate Baths.** Willi Machu and Adly Ragheb. *Werkstoffe und Korrosion,* v. 5, no. 6, June 1954, p. 217-222.

Anodic behavior of nickel in solutions of nickel sulfate. Formation of oxide layers during anodic polishing. Tables, graphs. 6 ref. (L19, Ni)

636-L. (Russian.) **Production of Bright Nickel Coatings From Ammonical Electrolytes.** N. A. Izgaryshev, N. T. Kudriavtsev and E. V. Morozov. *Doklady Akademii Nauk SSSR,* v. 96, no. 1, May 1, 1954, p. 143-144.

Economy of process and operating conditions. 7 ref. (L17, Ni)

637-L. (Russian.) **Application of Electrolytic Polishing for Removing Layers of Metals and Alloys for Determining Diffusion Coefficients.** M. B. Neiman and A. Ia. Shiniaev. *Doklady Akademii Nauk SSSR,* v. 96, no. 2, May 11, 1954, p. 315-318.

Diffusion of iron into nickel. Graphs, diagram. 4 ref. (L17, N1, Fe, Ni)

638-L. (Russian.) **Composition and Properties of a Complex Electrolyte of a Copper-Pyrophosphate Bath.** E. A. Ukshe and A. I. Levin. *Zhurnal Obshchei Khimii,* v. 24, no. 5, May 1954, p. 775-780.

Complex ion composition, instability constants, and relation of conductivity to concentration of components. Tables, graphs. 10 ref. (L17, Cu)

639-L. Automatic Brushing Deburrs Turbine Disks. R. DePastina and R. E. Eyre. *American Machinist,* v. 98, July 5, 1954, p. 124-125.

Shop-made brushing machine achieves lower costs, higher production, improved surface finish and more uniform results. Photographs. (L10)

640-L. Electronic Configuration in Electrodeposition From Aqueous Solutions. I. The Effect of Ionic Structures. II. The Deposition Process.

Ernest H. Lyons, Jr. *Electrochemical Society, Journal,* v. 101, July 1954, p. 363-381.

Major characteristics of electrode systems in electrodeposition explained on structural considerations. Table. 161 ref. (L17)

641-L. Depolarization Effects After Current Reversal at Silver Anodes and Cathodes. A. L. Ferguson and D. R. Turner. *Electrochemical Society, Journal,* v. 101, July 1954, p. 382-386.

Anode and cathode reactions at silver electrodes in hydrogen saturated 2*N* sulfuric acid following a current reversal. Diagrams, graphs. 19 ref. (L17, Ag)

642-L. The Zinc Coating of Paper for Capacitors by Vacuum Evaporation. L. Holland and K. Hacking. *Electronic Engineering,* v. 26, July 1954, p. 296-301.

Zinc atoms possess very low binding energies to nonmetallic surfaces and it is necessary to pre-coat the paper surface with nucleating film. Deposition techniques. Photographs, graphs. 22 ref. (L25, T1, Zn)

643-L. Cermets and Ceramic-Coated Metals Team Up With Jet Propulsion. Alexander Pechman. *Finish,* v. 11, July 1954, p. 35-37, 64.

Application and properties of cermet and ceramic coatings. Photographs. (L27, T25)

644-L. Extend Applications of Nickel Immersion Plating. A. E. Durkin. *Iron Age,* v. 174, July 8, 1954, p. 91-94.

Advantages and disadvantags of electroless process, properties of coatings. Micrograph, photograph, graphs, tables. (L16, Ni)

645-L. Chrome-Diffusion. R. H. Warring. *Machinery Lloyd (Overseas Ed.),* v. 26, June 19, 1954, p. 70-71, 73-74.

Chromizing procedures and applications. Graphs, diagrams, tables. (L15, Cr)

646-L. Kanigen Nickel Plating. Gregoire Gutzeit. *Metal Progress,* v. 66, July 1954, p. 113-120, 146.

Chemistry and process, characteristics and uses of plate deposited by electroless method. Tables, diagrams, micrograph, graph. 11 ref. (L14, Ni)

647-L. Notes on Solution of Problems in Odd Job Vapor Coating. W. L. Bond. *Optical Society of America, Journal,* v. 44, June 1954, p. 429-438.

Charts for solution of problems pertaining to vapor coating in general and coating of glass with various metals. Graphs, nomograms, diagrams. (L25)

648-L. Voltage and Current Fluctuations in the Output of Plating Rectifiers. V. L. Richards. *Plating,* v. 41, July 1954, p. 773-781.

Measurements using an oscilloscope. Effects of voltage fluctuations on current. Diagrams, graphs, tables. (L17)

649-L. Plating Applications in the Television Field. Leonard P. Fox. *Plating,* v. 41, July 1954, p. 785-788.

Unusual plating applications in the production of electron tubes. Microgarphs, photographs. (L17)

650-L. Effect of Surface Finishing of Nonferrous Base Metals on the Protective Value of Plated Coatings. George J. Kahan, W. W. Macchia and J. M. Fairbank. *Plating,* v. 41, July 1954, p. 789-792.

Method of surface finishing of rolled brass and zinc die castings had no pronounced effects on the protective value of electrodeposits. Table. 10 ref. (L14, L17, Cu, Zn)

651-L. Modern Plating Practice. Silver Plating. J. W. Round. *Product Finishing,* v. 7, June 1954, p. 58-62, 132.

Review of equipment, bath compositions, procedures. Table, photograph. 3 ref. (L17, Ag)

652-L. Productivity in the Paint Shop. E. Johnson. *Product Finishing,* v. 7, June 1954, p. 65-73.

Methods of avoiding waste, correct use of plant and equipment. Photographs. (L26)

653-L. Improving Productivity in Metal Finishing. E. E. Halls. *Product Finishing,* v. 7, June 1954, p. 74-80.

Methods of improving operating efficiency and resultant quality. Photograph. (L general)

654-L. Plastics in the Plating Shop. II. Tanks and Vessels. F. F. Jaray. *Product Finishing,* v. 7, June 1954, p. 88-92.

Properties and applications of plastics that have proved satisfactory in plating, pickling and other treatment of vessels and tanks. Photographs, table. (L26)

655-L. (Dutch.) **Surface Treatment of Metals.** *Bedrijf en Techniek,* v. 9, no. 204, June 19, 1954, p. 290-295, 298.

Anodizing of aluminum, plating, organic additives to lustrous nickel-plating baths, corrosion of nickel-cobalt deposits, automobile lacquers, auxiliary materials to resistance welding, electropolishing, corrosion through pores of coatings and electrolytic tin plating. Photographs, micrographs, diagrams. (L general, Al, Sn, Ni, Co)

656-L. (German.) **Electroplating With Tin Alloys.** J. W. Guthbertson. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 5, May 1954, p. 148-152.

Conditions and procedure with various alloys. Graphs, photographs. (L17, Sn)

657-L. (Russian.) **Reconditioning of Rotor Blades of Turboblowers by Weld Deposits.** N. S. Bashanov. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 82-83.

Process resulted in lowering ultimate strength of the blade by welding heat. Diagrams, photograph. (L24, SS)

658-L. (Book.) **Surface Protection Against Wear and Corrosion.** 461 p. 1954. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. $6.00.

Thirty papers presented during the 35th National Metal Congress and Exposition, Cleveland, Oct. 19 to 23, 1953. Covers wear testing, case hardening, hard facing, and coatings. Individual papers separately abstracted.
(L general, J28, Q9, R general)

659-L. (Book-German.) **(Practical Electrochemistry.)** Elektrochemisches Praktikum. E. Müller and H. Reuther. 9th Ed. 384 p. 1953. Theodor Steinkopf, Dresden and Leipzig.

A laboratory manual for a university electrochemistry course. Consists of series of experiments on fundamental electrochemistry as well as electrodeposition, inorganic and organic preparations, molten electrolytes, and electrothermal processes. (L17, C23, P15)

660-L. Trends in "Automation"—Electrolytic Tinning. Paul R. Gravenstreter and Robert E. Layton. *Applications and Industry,* 1954, no. 13, p. 97-100; disc., p. 100-101.

Electrical equipment and circuits for a tinning line powered by a single generator. Diagrams.
(L17, Sn)

661-L. Methods of Application. Arthur W. Slocum. *American Paint Journal,* v. 38, July 26, 1954, p. 80 + 5 pages.

Spray, dip, flow coat, roller coat, and tumble systems and their variations. 13 ref. (L26)

662-L. Some Tests of Electrolytic Tinplates in Cans for Australian Canned Foods. E. G. Davis. *Australian Journal of Applied Science,* v. 5, June 1954, p. 196-210.

Performance of cans. Suitability of Australian lacquers for the protection of electrotin plate against internal corrosion. Photographs, tables. 23 ref. (L17, L26, R5, Sn)

663-L. Industrial Alloy Plating With Special Reference to Plating of the Alpha-Phase. T. Banerjee. *Central Electrochemical Research Institute, Karaikudi, Bulletin,* v. 1, Jan. 1954, p. 8-10.

Literature review. Relation between properties of electrodeposited alloys and their crystal structure. 14 ref. (L17, M26, Cu)

664-L. Brass Plating With Special Reference to Plating From Non-Cyanide Baths. S. K. Ray. *Central Electrochemical Research Institute, Karaikudi, Bulletin,* v. 1, Jan. 1954, p. 11-13.

Review of research and development work on nonpoisonous baths. 18 ref. (L17, Cu)

665-L. Electropolishing in Relation to Engineering. S. Ramachandran. *Central Electrochemical Research Institute, Karaikudi, Bulletin,* v. 1, Jan. 1954, p. 14-16.

Electropolishing techniques. Advantages of process. 8 ref. (L13)

666-L. We Are Painting Shock Absorbers Electrostatically. I. J. Samuelson. *Industrial Finishing,* v. 30, July 1954, p. 18-21.

Equipment and operating procedures. Photographs, diagram. (L26)

667-L. Some Recent Developments in Vapour Blasting. *Machinery (London),* v. 85, July 2, 1954, p. 11-19.

Operation and advantages of the process. Photographs, micrographs, graph, diagrams. (L10, AY)

668-L. Barrel Finishing Operations on Accounting Machine Components. *Machinery (London),* v. 85, July 9, 1954, p. 55-61.

Results obtained with a new rotofinish installation. Photographs, diagrams. (L10)

669-L. Simplified Waste Treatment Methods for the Electroplating Industry. Leslie E. Lancy. *Metal Finishing,* v. 52, July 1954, p. 66-71.

Integrated waste treatment systems for cyanide copper and chromium plating plants. Photographs. 12 ref. (L17, A8, Cr, Cu)

670-L. Electroless Nickel Plating on Non-Ferrous Metals. Harry J. West. *Metal Finishing,* v. 52, July 1954, p. 72.

Bath formula; techniques.
(L14, Ni, EG-a)

671-L. Government Finishing Specifications. N. E. Promisel and David M. Promisel. *Metal Finishing,* v. 52, July 1954, p. 73.

Specifications for phosphoric-acid base metal conditioner and rust remover. (L14, S22)

672-L. Selection of Metal Cleaning Methods. ASM Committee on Metal Cleaning. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 131-134.

Removal of drawing compounds, chips, cutting oils, polishing compounds, scale, and other materials from steel parts. Health hazards. (L10, L12, ST)

673-L. Disposal of Electroplating Wastes by Oneida, Ltd. I. Survey of Wastes. Charles A. Walker and Paul W. Eichenlaub. **II. Development of Treatment Processes.** Charles A. Walker, Walter Zabban, Raymond W. Southworth, and E. P. Heslin. *Sewage and Industrial Wastes,* v. 26, July 1954, p. 843-853.

Treatment facilities and procedures for cyanide and alkali wastes. Diagram, tables. 6 ref. (L17, A8)

674-L. A Survey of the Vitreous-Enamelling Industry in Sweden, Denmark and Finland. J. H. Gray. *Sheet Metal Industries,* v. 31, no. 327, July 1954, p. 589-599.

Equipment and processes; costs; production statistics. Tables, photographs. (L27)

675-L. Engineering Metal Finish. Methods, Materials Command Equal Stature. Robert J. Deisenroth. *Steel,* v. 135, July 19, 1954, p. 115-116, 121.

Finishing cycle for application of all-weather paint coating on metal furniture. Photographs, tables. (L26)

676-L. Displacement Tinning of Aluminium. *Tin and Its Uses,* 1954, no. 30, p. 8.

Chloride and stannate processes of immersion coating; etching treatments; problems of adhesion. (L16, Sn, Al)

677-L. Recent Developments in Hardfacing. E. N. Gregory. *Welding and Metal Fabrication,* v. 22, July 1954, p. 272-273.

Discussion of electrodes and automatic methods. (L24)

678-L. Sprayed Plastic Coatings for Fabricated Wire Articles. R. Dickinson. *Wire Industry,* v. 21, July 1954, p. 701-702.

Surface preparation and application methods. (L26)

679-L. (French.) **The Conditions of Growth of Anodic Aluminum Oxide Films.** J. Hérenguel and P. DeLong. *Revue de métallurgie,* v. 51, no. 6, June 1954, p. 411-418; disc. p. 418.

Interferometric method used to study increase in thickness of film and its refractive index. Micrographs, graphs, table, photographs. 9 ref. (L19, Al)

680-L. (German.) **The Intensified Attack of Zinc on Iron in Temperature Region of 500 C.** Dietrich Horstmann. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 215-219.

Structure and transformation of iron-zinc alloys during galvanizing. Micrographs, graphs. 10 ref. (L16, M27, Fe, Zn)

681-L. (German.) **Conditions of Deposition and Structure of Dense Electrolytic Metal Deposits. I. Electrolytic Copper Deposits in the Range of Field-Oriented Texture Type and the Unoriented Dispersion Type.** J. Elze. *Metall,* v. 8, nos. 13-14, July 1954, p. 519-526.

Preparation of deposits and samples, microstructure and hardness studies, effect of inhibitors in electrolyte, and impurities in deposits. Tables, micrographs. 30 ref. (L17, M27, Q29, Cu)

682-L. (German.) **Runs on Zinc Galvanized Sheet Metals and Utensils.** Hans-Joachim Wiester and Dietrich Horstmann. *Stahl und Eisen,* v. 74, no. 13, June 17, 1954, p. 831-834.

Defect formation in hot-dipped sheet metal. Photographs, micrographs. 3 ref. (L16, Zn, ST)

683-L. (German.) **Streaking on Zinc Galvanized Sheet Metals.** Hans-Joachim Wiester and Dietrich Horstmann. *Stahl und Eisen,* v. 74, no. 13, June 17, 1954, p. 835-838.

Surface defects or adsorbed hydrogen as causes. Photographs, micrographs. 9 ref. (L16, Zn, ST)

684-L. (German.) **The Acid Pickle—A Closed Circuit?** Walter Fackert. *Stahl und Eisen,* v. 74, no. 14, July 1, 1954, p. 888-894.

Theoretical and laboratory investigation of circulating bath which retains constant H_2SO_4 concentration. Graphs, table, diagrams. 3 ref. (L12)

685-L. (German.) **Plant Investigations on Galvanizing Tanks.** Kurt Lewus. *Stahl und Eisen,* v. 74, no. 14, July 1, 1954, p. 903-904.

Measurements of bath and tank-wall temperatures, heat input and losses, and gas consumption under different operating conditions. Graphs. 1 ref. (L16, Zn)

686-L. (Russian.) **Process of Electrochemical Deposition of Oxygen on Nickel.** L. M. Elina, T. I. Borisova, and Ts. I. Zalkind. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 5, May 1954, p. 785-796 + 2 plates.

Curves of oxygen overvoltage at nickel electrode; nickel electrode charging; and fall of excess voltage

after current shut-off. Diagram, graphs, tables, oscillograms. 15 ref. (L17, Ni)

687-L. (Russian.) **Cathodic Polarization During Precipitation of Copper From Pyrophosphate Solutions.** I. G. Shcherbakov, and I. L. Agafonov. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 5, May 1954, p. 865-872.

Relation of polarization to concentration of complex anion. Effect of temperature and current density. Diagram, graphs, tables. 10 ref. (L17, Cu)

688-L. (Russian.) **Reduction of Nickel by Hypophosphate. I. Conditions of Formation and Some Properties of Platings. II. Problem of Reaction Mechanism.** K. M. Gorbunova and A. A. Nikiforova. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 5, May 1954, p. 883-901 + 1 plate.

Factors affecting plating. Structure and properties of nickel platings. Tables, graphs, micrographs. 15 ref. (L17, Ni)

689-L. Plating in the Automotive Industry: Its History and Development. William M. Phillips. *Metal Finishing,* v. 52, July 1954, p. 60-65.

Chronological milestones since 1892. Photographs, table. (To be continued.) (L17, T21, A2)

690-L. Metal Cleaning. K. G. Lewis. *Metal Treatment and Drop Forging,* v. 21, June 1954, p. 277-283; July 1954, p. 335 + 8 pages.

Chemical and electrolytic pickling and descaling. Solution control by inhibitors. Descaling solutions for stainless steels. Tables, diagrams, photographs. 64 ref. (To be continued.) (L12, L13, SS)

691-L. Oxidation Resistance of Diffusion Coatings on Sintered and Swaged Molybdenum Wire. C. J. Leadbeater and D. T. Richards. *Metal Treatment and Drop Forging,* v. 21, July 1954, p. 309-315.

Volatilization of molybdenum oxide checked by treatment with single and duplex coatings. Preparation and physical considerations. Tables, micrographs, graphs. 3 ref. (To be continued.) (L15, R2, Mo)

692-L. Protection of Steel. I. Martin E. Schleicher. *Paint Industry Magazine,* v. 69, July 1954, p. 18-19.

Surface preparation by chemical solvent and physical methods. (To be continued.) (L general, ST)

693-L. Paint Film Defects and Their Remedies. III. Cissing: Pinholing: Blistering. H. J. Testro. *Product Finishing,* v. 7, June 1954, p. 81-87.

Review of terms used to define types of paint film failure and possible remedies, Photographs. (L26)

694-L. Finishes for Aluminum. I. Mechanical Finishing. R. Vanden Berg. *Screw Machine Engineering,* v. 15, July 1954, p. 37-40.

Barrel burnishing, grinding, brushing and buffing. Photographs. (L10, Al)

695-L. (French.) **Study of Anodic Dissolution by Means of Faraday Law.** Israel Epelboin and Michel Froment. *Comptes rendus,* v. 238, no. 25, June 21, 1954, p. 2416-2418.

Determination of necessary energy. 2 ref. (L19)

696-L. (French.) **Galvanizing of Tubes.** H. Bablik. *Métallurgie et la construction mécanique,* v. 86, no. 6, June 1954, p. 531, 533, 535.

Influence of length of immersion, rate of shrinkage and blowing. Tables, graphs, diagram. (L16, Zn)

697-L. (German.) **The Adhesion of Paints to Aluminum.** K. Broockmann. *Aluminium,* v. 30, no. 7, July 1954, p. 279-283.

Physical and chemical reactions producing good adhesion properties. Tables. 21 ref. (L26, Al)

698-L. (German.) **New Protective Process for Use on Aluminum as a Form Material for Concrete.** H. Kessler. *Aluminium,* v. 30, no. 7, July 1954, p. 285-287.

Film for protection against mechanical and chemical damage to aluminum. 6 ref. (L14, Al)

699-L. Hard Chrome Can Be Plated to 'Tenths' in Production. George de Mirjian. *American Machinist,* v. 98, Aug. 2, 1954, p. 101-103.

Controlled solution temperatures, current density and plating time eliminates subsequent grinding and lapping to size, provides better surface. Photographs, graph, diagram. (L17, Cr)

700-L. Corrections for Seven Defects in Enameled Aluminum. *Ceramic Industry,* v. 63, Aug. 1954, p. 67-68.

Defects include low gloss and acid resistance, spalling and tearing. (L27, Al)

701-L. Topic of the Month. A Method of Protecting Heating Coils in Some Corrosive Solutions. G. G. Schmuck and R. W. Flournoy. *Corrosion,* v. 10, Aug. 1954, p. 231.

Fluorocarbon plastic material found useful in many corrosives at temperatures up to 400° F. Heat transfer loss is insignificant. Photograph. (L26)

702-L. Investigation of Synthetic Fingerprint Solutions. Stanley J. Eisler and Harry L. Faigen. *Corrosion* v. 10, Aug. 1954, p. 237-242.

Method removes contaminants from steel surfaces in preparing material for storage. Tables, photographs. 18 ref. (L12, ST)

703-L. Testing Tank Car Linings. J. Robert Spraul. *Corrosion,* v. 10, Aug. 1954, p. 243-247; disc., p. 247.

Corrosive factors and conditions for preferred use of protective coatings on tank car interiors. Tables, photograph. 4 ref. (L general)

704-L. Electronic Configuration in Electrodeposition From Aqueous Solution. III. Metal Deposition From Certain Complex Ions. Ernest H. Lyons, Jr., John C. Bailar, Jr., and H. A. Laitinen. *Electrochemical Society, Journal,* v. 101, Aug. 1954, p. 410-414.

Determinated by cathode current efficiencies and polarograms. Tables. 30 ref. (L17)

705-L. Electromachining and Superfinishing as a Production Tool. I. The Process and Its Applications. A. T. Steer. *Electroplating and Metal Finishing,* v. 7, July 1954, p. 249-255.

Use of electropolishing solutions for controlled removal of metal and to produce a smooth and lustrous surface. Micrographs, tables, graphs. 8 ref. (L13, G17)

706-L. Nickel and Chromium Plating of Zinc Base Die Castings. *Electroplating and Metal Finishing,* v. 7, July 1954, p. 257-262.

Properties of the die castings, methods of polishing, cleaning and etching, direct nickel plating, the use of various copper strike processes and barrel plating. Tables, photographs. 8 ref. (L17, Cr, Ni, Zn)

707-L. Depreciation and Maintenance of Metal Finishing Plant. III. The 'Percentage' Method of Computing Depreciation of Plant. S. Howard Withey and F. Comm. *Electroplating and Metal Finishing,* v. 7, July 1954, p. 263-265.

Advantages of method. Examples. Tables. (To be continued.) (L general, A5)

708-L. Sprayed Zinc Coatings for the Protection of Iron and Steel. E. E. Halls. *Electroplating and Metal Finishing,* v. 7; *Metal Spraying,* v. 4, July 1954, p. 279, 281, 283-284.

Description of spraying process, use in combination with paint finishes. Photographs, table. (To be concluded.) (L23, L26, Zn, ST)

709-L. Flame-Sprayed Plastic Coatings. M. M. Renfrew and A. J. Freeman. *Organic Finishing,* v. 15, July 1954, p. 8-10.

Equipment and materials, advantages and disadvantages. Photographs. 7 ref. (L26)

710-L. A New Method of Protecting Magnesium. R. Stricklen. *Precision Metal Molding,* v. 12, Aug. 1954, p. 59 + 7 pages.

Chromate conversion coating. Properties, surface preparation, application and testing. Photographs, tables. 4 ref. (L14, Mg)

711-L. Automatic, Bulk Flash Removal on Die Castings. Eugene F. Anderson. *Precision Metal Molding,* v. 12, Aug. 1954, p. 65-67, 82.

Airless blasting machine avoids much hand work. Photographs. (L10)

712-L. Finishing Metal Surfaces for Aircraft Gas Turbines. W. B. Stephenson, Jr. *Products Finishing,* v. 18, Aug. 1954, p. 24-29.

Surface protection from corrosion and abrasion at temperatures and in air velocities far beyond natural element exposure. Photographs, diagram. (L general)

713-L. A Review of Cleanliness Tests Jay C. Harris. *Products Finishing,* v. 18, Aug. 1954, p. 32-36.

Compilation of methods. Tables. 6 ref. (L10, L12, L13)

714-L. Electroforming. A Method for Producing Intricate Shapes. Vernon A. Lamb and W. H. Metzger, Jr. *Tool Engineer,* v. 33, Aug. 1954, p. 55-62.

Matrix design and use, part design factors, metals and plating solutions. Photograph, micrographs, tables, diagrams. 5 ref. (L18)

715-L. British Trends and Advances in Metal Finishing. S. Wernick. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 21 + 18 pages.

Tin alloy deposition, design of automatic and barrel plating plant, mechanical and electrolytic polishing. Bright nickel plating and chromium plating. Uses of plastics in the plating shop. Organic finishes and finishing. Photographs, micrographs. (L17, L10, L13, L26)

716-L. Progress and Developments in Electrodeposition in Belgium Since 1945. R. Corbiére. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 53-55.

Wartime difficulties, improvements in baths and equipment, quality control procedures. (L17)

717-L. Metal Finishing in Canada. F. Campbell Rutherford. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 57-59, 61, 63.

Production statistics. Developments in electroplating, anodizing, hot dipping and chemical and organic finishes. Table. (L general)

718-L. Recent Developments in Metal Finishing in Finland. Roy Kyrklund. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 65 + 6 pages.

Trends in electroplating and organic finishing. Photographs. (L17, L26)

719-L. The Quality Control of Metallic Coatings in France. P. Morisset. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 75-79, 82-84.

Establishment of standards for electroplated, anodized, sprayed metal and galvanized coatings. Standards define and classify different types of metal coating and set up various methods for controlling and measuring their thickness. Photographs, tables, graphs. (L17, L19, L23, L16, S22)

720-L. Recent Progress and Future Trends in German Electroplating and Metal Finishing. R. Springer. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 87 + 15 pages.

Improvements in equipment, baths and operating procedures. Photographs. 20 ref. (L17)

721-L. Electroplating in Holland. Jules Odekerken. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 109-111, 113.

Survey of preparatory treatment, equipment, baths. (L17)

722-L. Metal Finishing Trends in India. T. Banerjee. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 115 + 8 pages.

Electroplating, anodizing, organic coatings. Photographs. (L17, L19, L26)

723-L. The Metal Finishing Industry in New Zealand. Stuart H. Wilson. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 127 + 6 pages.

Present status and types of electroplating and other finishes. (L general)

724-L. Progress in Swedish Metal Finishing. H. C. Qvarnström. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 137 + 5 pages.

Improvements in electroplating equipment and techniques. Photographs. (L17)

725-L. Electrodeposition in Switzerland at the Present Day. H. Reymond. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 147 + 5 pages.

Survey of preparatory treatments and plating procedures. Photographs. (L17, L18)

726-L. Electroplating Developments in the United States. D. Gardner Foulke. Paper from "International Review of Metal Finishing". Sawell Publications, Ltd., p. 157 + 8 pages.

Improvements in equipment and processes. Waste treatment. Photographs. 94 ref. (L17, A8)

727-L. (German.) **Ematal Process of Surface Treatment.** W. W. G. Hübner. *Aluminium,* v. 30, no. 7, July 1954, p. 283-284.

Characteristics, methods of applying and examples of various applications of anodic oxidation in oxalic acid. Photographs. 4 ref. (L19, Al)

728-L. (German.) **Further Development of the Metal Spraying Technique.** Hans Reininger. *Metalloberfläche,* Ausgabe B, v. 6, no. 7, July 1954, p. 102-104.

Comparison of commercial processes. Photographs, micrographs, table. (To be continued.) (L23)

729-L. (German.) **Metallizing Nonconductors.** F. Elser. *Metalloberfläche,* Ausgabe A, v. 8, no. 7, July 1954, p. 107-110.

Chemical and mechanical methods of applying metals to plastics, glass, porcelain and wood. Tables, graph. (To be concluded.) (L general)

730-L. (German.) **Jigs and Fixtures for Hard Facing, by Deposition Welding, of Worn Parts of Brown-Coal Mining Machinery.** W. Prinz. *Schweissen und Schneiden,* v. 6, no. 7, July 1954, p. 296-298.

Equipment and techniques. Photographs, diagrams. (L24, ST)

731-L. (German.) **Chemical Polishing of Brass and Nickel Silver. I. Composition of the Polishing Bath. II. Microscopic Appearance of the Polished Surface.** Gerhard Schmid and Heinz Spähn. *Zeitschrift für Metallkunde,* v. 45, no. 6, June 1954, p. 392-401.

Effects of composition and temperature, methods of grading surface finish. Diagrams, graphs, micrographs. 7 ref. (L12, M27)

732-L. (Russian.) **Certain Problems in a Working Theory of Wheel Polishing.** G. B. Lur'e. *Vestnik Mashinostroeniia,* v. 34, no. 5, May 1954, p. 44-50.

Optimum times and conditions for

various stages of polishing and finishing. Graphs, tables. (L10, ST)

733-L. (Russian.) **Selection of Rational Electrolysis Conditions for Production of Porous Chrome Plating.** G. K. Shvyriaev and M. A. Shluger. *Vestnik Mashinostroeniia,* v. 34, no. 5, May 1954, p. 64-68.

Influence of current density, temperature and composition of electrolyte. Table, micrographs, graphs. 5 ref. (L17, Cr, ST)

734-L. (Book.) **Chromium Plating.** P. Morisset, J. W. Oswald, C. R. Draper and R. Pinner. 611 p. 1954. Robert Draper Ltd., 83/85 Udney Park Road, Teddington, Middlesex, England. $11.

Production, properties and applications of all types of chromium electrodeposits. Includes auxiliary processes such as testing, grinding, polishing, solution analysis and health hazards. (L17, Cr)

735-L. (Book.) **International Review of Metal Finishing.** I. S. Hallows, editor. 171 p. 1954. Sawell Publications Ltd., 4 Ludgate Circus, London E.C.4, England. 10s/6d.

Twelve papers, separately abstracted, on trends in electroplating and coating industries of Canada, India, New Zealand, Europe and the United States. (L general)

736-L. Corrosion Resistant Finishes. Arno J. Liebman. *American Paint Journal,* v. 38, Aug. 9, 1954, p. 26 + 6 pages.

Baked coatings, coatings in the form of linings metallizing under organic coating systems, care along weld-seams, coatings in hidden areas. 21 ref. (L26, L23)

737-L. Industrial Finishes. C. G. Moore. *American Paint Journal,* v. 38, Aug. 9, 1954, p. 77 + 10 pages.

Crystallizing, hammer, wrinkle and spatter finishes; crackle lacquers. 32 ref. (L26)

738-L. Chromium Diffusion as a Commercial Process. R. L. Samuel and N. A. Lockington. *Industrial Finishing (London),* v. 6, July 1954, p. 896 + 10 pages.

Process and results obtained. Graphs, diagrams, tables. 12 ref. (L15, Cr)

739-L. The Future of Electroplating. William Blum. *Institute of Metal Finishing, Bulletin,* v. 4, Summer 1954, p. 107-120; disc., p. 121-126.

Predictions covering next 25 yr. (L17)

740-L. Some Aspects of Tinning by Immersion Processes. D. E. Weimer and J. W. Price. *Institute of Metal Finishing, Bulletin,* v. 4, Summer 1954, p. 163-176.

Contact process and tinning of aluminum alloys by simple immersion. Tables, graphs. 7 ref. (L16, Al, Sn)

741-L. Studies on Metallizing of Non-Metals. I. Nickel Sulphate-Pyridine Bath. K. Chakraborty and T. Banerjee. *Journal of Scientific & Industrial Research,* v. 13, sec. B, June 1954, p. 433-440.

Influence of various factors on nickel microfilms formed on glass by reduction of nickel sulfate with sodium hydrosulphite in presence of pyridine. Tables, graphs. 23 ref. (L14, Ni)

742-L. Anti-Corrosion Advances in Light Metals. Emo D. Porro. *Light Metal Age,* v. 12, Aug. 1954, p. 12-13, 29.

Metallic plating, organic and inorganic coatings. Cathodic protection. (L general, R10, Al, Mg)

743-L. Adherence of Paint Films. E. G. Bobalek. *Metal Progress,* v. 66, Aug. 1954, p. 113-119.

Effect of pigments, thinners and application conditions. Photographs, micrographs, diagrams. (L26)

744-L. Electrocladding of Reactor Materials. John G. Beach and Charles L. Faust. Paper from "Nuclear Engineering. Pt. I". American Institute of Chemical Engineers, p. 31-38.

Electrocladding of aluminum, beryllium, magnesium and zirconium. Surface preparation, activation treatments. Photographs, tables, micrographs. 12 ref. (L22, Al, Be, Mg, Zr)

745-L. (English.) **Chromizing of Spheroidal Graphite Cast Iron.** Shigetomo Ueda. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 39-41.

Chromium chloride process. Wear tests of chromized surface. Micrograph, diagram, graph. 2 ref. (L15, Q9, Cr, CI)

746-L. (French.) **Influence of Withdrawal Rate on the Thickness of Zinc Coatings.** A. Gordet. *Métallurgie et la construction mécanique,* v. 86, nos. 7-8, July-Aug. 1954, p. 593, 595.

Proper selection of withdrawal rate is very important in obtaining uniform galvanizing. (L16, CN, Zn)

747-L. (French.) **Notes on the Gaseous Chromizing of Steel.** Paul R. Duré. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 531-541.

Review of techniques, equipment and applications. Micrographs, diagrams, tables. (L15, ST, Cr)

748-L. (German.) **Dust Dangers in Metal Enamel Manufacturing.** K. Meures. *Staub,* 1954, no. 36, p. 260-263.

Dangers to health (silicosis) and to cleanliness of product. Means of countering dangers. (L27, A7)

749-L. (Hungarian.) **Electrochemical Investigation of Corrosion-Inhibitive Phosphate Coatings. II. The Effect of Aftertreatment in Hot and Cold Phosphatizing.** Klara Kovacs. *Magyar Kémikusok Lapja,* v. 9, no. 7, July 1954, p. 210-213.

Interpretation of studies on breakdown potential of various phosphate treatments. Graphs, tables. 4 ref. (L14, R11)

750-L. Aluminized Coatings. A. G. Thomson. *Aircraft Engineering,* v. 26, Aug. 1954, p. 226.

Comparison of hot dip coating with aluminum and hot galvanizing. Corrosion resistance, mechanical properties and costs. (L16, R general, Q general, Al, Zn)

751-L. Hard Chrome Plate Pays Unexpected Dividends. Walter White and Martin McKean. *American Machinist,* v. 98, Aug. 16, 1954, p. 142-143.

Advantages of plating tools and gages. Salvage of castings by using plating to build up overmachined surfaces. Photographs. (L17, Cr)

752-L. Thick Insulating Ceramic Coatings for Metal. *Ceramics,* v. 6, July 1954, p. 207-217.

Compositions, application by dipping or ramming. Properties. Tables, diagram, graphs. (L27)

753-L. Flame Spraying Increases Versatility of Refractory Coatings. Frank Charity. *Consulting Engineer,* v. 4, Aug. 1954, p. 36-37.

Types of coatings and application procedures. Photographs, table. (L27)

754-L. Scumming of Enamels. Final Report of Sub-Committee of the Institute of Vitreous Enamellers. *Foundry Trade Journal,* v. 97, Aug. 5, 1954, p. 153-158.

Summaries of research literature on scumming covering the associated industries of ceramics and glass. Graph, tables. (L27)

755-L. Metal Cleaning and Its Improvement by the Use of Ultrasonics. T. J. Kearney. *Institute of Radio Engineers, Transactions of the I.R.E. Professional Group on Ultrasonics Engineering, PGUE*-1, June 1954, p. 43-47.

History and development of process. Transducers producing ultrasonic waves. Production equipments. Photographs. (L10)

756-L. Phosphorized Anodes Produce Smoother, Heavier Copper Plate. R. P. Nevers, R. L. Hungerford and E. W. Palmer. *Iron Age,* v. 174, Aug. 12, 1954, p. 114-116.

Copper electrodes containing at least 0.005% phosphorus or arsenic give better results than high-purity electrodes. Micrograph, table, photographs. 3 ref. (L17, Cu)

757-L. Improvement of the Corrosion Resistance of Tinplate by a Chemical Treatment. S. C. Britton and R. M. Angles. *Journal of Applied Chemistry,* v. 4, July 1954, p. 351-364.

Treatment in sodium chromate-sodium hydroxide solution found practical for food cans. Photographs, graphs, table. 5 ref. (L14, Sn)

758-L. The Mechanism of the Corrosion-Inhibitive Action of Paints, With Special Reference to Basic Pigments. J. E. O. Mayne and D. van Rooyen. *Journal of Applied Chemistry,* v. 4, July 1954, p. 384-394.

Use of a basic pigment modifies anodic reaction. Studies of the linoleates of lead, zinc, calcium, barium and strontium. Tables, graphs, diagram. 27 ref. (L26, R10)

759-L. Applications of Dewatering Fluids. R. H. Warring. *Machinery Lloyd (Overseas Ed.),* v. 26, July 31, 1954, p. 62-67.

Theory, properties, types, application methods and advantages in finishing operations. Diagrams. (L12)

760-L. Finishing in the Heart of Industrial Europe. Joan T. Wiarda and Marvin Rubinstein. *Metal Finishing,* v. 52, Aug. 1954, p. 51-64.

Technical study of electroplating shops in Belgium, England, France, West Germany, Italy, the Netherlands and Switzerland. Photographs, tables. (L17)

761-L. Commercial Aspects of European Finishing. Joan Wiarda and Marvin Rubinstein. *Metal Finishing,* v. 52, Aug. 1954, p. 65-66.

Factors such as war damage and national confinement on electroplating facilities. Photographs. (L17)

762-L. Plating in the Automotive Industry: Its History and Development. William M. Phillips. *Metal Finishing,* v. 52, Aug. 1954, p. 73-77.

Advent of auto grilles, stainless steel, bright plating and World War II. Photographs. (To be concluded.) (L17)

763-L. Surface Treatment and Finishing of Light Metals. IV. Chemical Cleaning and Pre-Treatment Processes. S. Wernick and R. Pinner. *Metal Finishing,* v. 52, Aug. 1954, p. 78-82, 97.

Cleanliness tests and cleaning methods for various requirements. (To be continued.) (L12)

764-L. Asphalt Roofing Aluminum Paint and Its Effect on Leafing. Raymond H. Frederick and W. P. Woosley. *Paint and Varnish Production,* v. 44, Aug. 1954, p. 28-33.

Effects of vehicle components. Tables, graphs. (L26, Al)

765-L. Thermal Radiations and Surface Coatings. K. Magnusson. *Paint Manufacture,* v. 24, Aug. 1954, p. 255-257.

Reports on absorptivity and reflectivity of several coatings, especially with aluminum pigments. Photographs, tables. 3 ref. (L26, Al)

766-L. Fighting Corrosion, Erosion, and Reducing Metal Temperatures in Vessels and Lines With Monolithic Linings. Walter A. Bradbury. *Petroleum Engineer,* v. 26, Aug. 1954, p. C57 + 5 pages.

At high temperatures monolithic linings have given good service in hydrocarbon-catalyst media for three years; in catalyst service these linings have stood up for six years. Graphs, photographs, diagrams, table. (L26, CN)

767-L. Evaporated Multiple Layers With Semiconductor Properties. J. C. M. Brentano and J. D. Richards. *Physical Review,* v. 95, ser. 2, Aug. 1, 1954, p. 841-843.

Alternate deposition of iron and lead on Pyrex in high vacuum. Analysis of conductance with time and temperature. Graphs. 4 ref. (L25, P15, Fe, Pb)

768-L. A Study of Leveling in Acid Copper Baths. Fred I. Nobel and Barnet D. Ostrow. *Plating,* v. 41, Aug. 1954, p. 892-899; disc., p. 899-900.

Evaluation of factors and addition agents. Graphs. 6 ref. (L17, Cu)

769-L. A Study of Leveling in Cyanide Copper Baths. Barnet D. Ostrow and Fred I. Nobel. *Plating,* v. 41, Aug. 1954, p. 885-891; disc., p. 899-900.

Surface evaluation; effects of free potassium cyanide, current density, agitation, carbonate build-up, and tartrate on leveling action and proprietary addition agents. Photograph, graphs. 8 ref. (L17, Cu)

770-L. Industrial Applications for Metallized Nonconductors. Harold Narcus. *Plating,* v. 41, Aug. 1954, p. 901-902, 907-913; disc., p. 913-914.

Electronics, slush molds, spray masks and medicine. Photographs, tables. 9 ref. (L general)

771-L. Finishes for Aluminum. II. Chemical & Electrochemical Finishing. R. Vanden Berg. *Screw Machine Engineering,* v. 15, Aug. 1954, p. 41-47.

Bright dip, frosted finish, chemical oxide and phosphate coatings, anodic oxidation and electroplating. Photographs, table, diagram. (L general, Al)

772-L. The Effect of Welding Variables on Hard-Facing Deposits. A. Zvanut and V. Peters. *Welding Journal,* v. 33, Aug. 1954, p. 778-782.

Hard facing deposits are affected by welding variables which determine deposit analysis and cooling rate of the deposit. Tables, graphs. (L24)

773-L. Right Metal in the Right Place. George H. Thurston. *Western Machinery and Steel World,* v. 45, Aug. 1954, p. 86-90.

Characteristics and application of hard surfacing materials. Diagrams. (L24)

774-L. Anodic Oxidation of Metals With Different Surface Textures. G. S. Vozdvizhenskii, A. Sh. Valeev and T. N. Grechukhina. *Henry Brutcher, Altadena, Calif., Translation no.* 3055, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 72, no. 2, 1950, p. 311-313.)

Previously abstracted from the original. See item 504-L, 1950. (L19, Al)

775-L. Hot Tinning Problems. G. I. Chufarov, M. G. Zhuravleva, E. P. Tatievskaya, B. D. Averbukh and V. K. Antonov. *Henry Brutcher, Altadena, Calif., Translation no.* 3262, 8 p. (From *Zhurnal Prikladnoi Khimii,* v. 25, 1953, p. 652-655.)

Previously abstracted from original. See item 51-L, 1954. (L16, Zn, Sn)

776-L. Descaling by Reducing the Scale With Sodium Hydride. A. V. Smirnov, S. A. Semenkovich and F. A. Bogachev. *Henry Brutcher, Altadena, Calif., Translation no.* 3307, 9 p. (From *Vestnik Mashinostroeniya,* v. 33, no. 3, 1953, p. 37-39.)

Advantages of reducing scale with sodium hydride compared with three other descaling processes. Table, diagram. 3 ref. (L12, ST)

777-L. Gas Chromizing of Steel Using Ceramic Materials. G. N. Dubinin. *Henry Brutcher, Altadena, Calif., Translation no.* 3316, 6 p. (From *Vestnik Mashinostroeniya,* v. 33, no. 12, 1953, p. 69-70.)

Use of porous ceramics saturated with chromium chloride to produce

a steady supply of chromium. Equipment and techniques. Table, diagrams, micrograph. 7 ref. (L15, Cr, ST)

778-L. Investigation of Some Slushing Oils Capable of Protecting Steel Parts From Corrosion During Processing and Storage. V. V. Skorchelletti and V. E. Piskorskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3317, 9 p. (From *Zhurnal Prikladnoi Khimii,* v. 27, no. 3, 1954, p. 314-318.)

Previously abstracted from original. See item 502-L, 1954. (L26, ST)

779-L. Regeneration of Electropolishing Solutions for Steel. N. P. Fedot'ev, E. G. Kruglova and S. Ya. Grilikhes. *Henry Brutcher, Altadena, Calif., Translation no.* 3334, 14 p. (From *Zhurnal Prikladnoi Khimii,* v. 27, no. 2, 1954, p. 157-165.)

Previously abstracted from original. See item 475-L, 1954. (L13, ST)

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Influence of the quality of steels treated and conditions of treatment on the quality of protection conferred by thermal chromizing. Photographs, tables, micrographs. (L15, J general, ST)

781-L. (French.) **"Integrated Chromizing": Combination of a Simple Heat Treatment With a Thermochemical Chromium Cementation Treatment.** Ph. Galmiche. *Revue de métallurgie,* v. 51, no. 7, July 1954, p. 498-501; disc., p. 501-502.

Examples of cases where a metal surface-diffusion treatment, chromizing in particular, can be combined with an ordinary heat treatment process. Micrographs, diagrams, tables. (L15, J general, Fe, Cr)

782-L. (German.) **Prolonging the Service Life of Drill Bars.** Hermann v. Braunmühl. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 7, July 1954, p. 289-290.

Hard facing of drill bits resulted in tripled service life. Photographs. (L24)

783-L. (German.) **Contribution to the Behavior of Freshly Vapor-Deposited Metal Films.** H. Gobrecht. *Zeitschrift für Physik,* v. 138, nos. 3-4, 1954, p. 345-352.

Measurements with a needle counter indicate that the fading of electron emission depends on rate of deposition and surface density. Diagram, graphs, micrographs. 5 ref. (L25, P10, Sb, Pb)

784-L. Tin-Nickel Alloy Plating. A New Decorative and Protecting Coating. *Automobile Engineers,* v. 44, Aug. 1954, p. 320-322.

Equipment, anodes, process operation and control. (L17, Ni, Sn)

785-L. Removing Metal by Chemistry to Produce Difficult Shapes for Aircraft Structures. Manuel C. Sanz. *Automotive Industries,* v. 111, Sept. 1, 1954, p. 54-57, 112, 114.

Chemical milling by controlled etching of aluminum. Photographs, diagrams. (L12, Al)

786-L. Ceramic Coatings for Use in Nuclear Reactors. *Ceramic Age,* v. 64, sec. 1, Aug. 1954, p. 40-42.

Boron-free coatings having very low thermal neutron absorption coefficients. Tables, micrographs. 9 ref. (L27)

787-L. Radiometric Study of Phosphate Coatings Formed on Steel in Pretreatment Baths. Thomas F. Boyd, Michael Galan and Leonard Markowitz. *Corrosion,* v. 10, Sept. 1954, p. 285-288.

No correlation found between amount of coating and degree of protection using various treatments. Tables. 2 ref. (L14, CN)

788-L. Machine Methods Make Strip Transmission Line. K. S. Packard. *Electronics,* v. 27, Sept. 1954, p. 148-150.

Copper-clad dielectrics permit fabrication of microwave components. Diagrams, photographs, graph. 2 ref. (L22, T1, Cu)

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Difficulties, and attempts to overcome them. Use of fused baths and organic electrolytes. Photographs, micrograph, diagram, table. 34 ref. (L17, Al)

790-L. The History of Electrolytic and Chemical Polishing. R. Pinner. *Electroplating and Metal Finishing,* v. 7, Aug. 1954, p. 295-298.

Origin and development. 11 ref. (L13, L12)

791-L. Investigations Into the Metal-Spraying Process. A. Matting and K. Becker. *Engineers' Digest,* v. 15, Aug. 1954, p. 309-314. (From *Schweissen und Schneiden,* v. 6, no. 4, Apr. 1954, p. 127-142.)

Previously abstracted from original. See item 517-L, 1954. (L23)

792-L. Bimetallic Castings. Achieved by Bonding Process. Vincent Delport. *Foundry,* v. 82, Sept. 1954, p. 102 + 5 pages.

Techniques of producing aluminum castings with steel or cast iron inserts. Micrograph, photographs. (L22, Al, CI)

793-L. Controlled Air Conditioning in Metal Finishing. *Industrial Finishing (London),* v. 7, Aug. 1954, p. 31-32, 34, 36.
Advantages and equipment for cleaning air and controlling humidity. Diagrams. 6 ref. (L general, A7)

794-L. Descaling and Pickling Titanium. Thomas A. Dickinson. *Industrial Finishing (London),* v. 7, Aug. 1954, p. 43-44.
Precautions and processes for various conditions. Photographs. (L10, L12, Ti)

795-L. New Developments Teamed Up to Make High-Quality, Low-Cost Hard Surfacing Deposits. L. K. Stringham. *Iron Age,* v. 174, Sept. 2, 1954, p. 103-105.
Feeding two carbon steel electrodes through a submerged-arc welding head plus alloying ingredient in flux simultaneously permits high rate of deposition. Photographs. (L24, AY)

796-L. Test Gives Bond Life Expectancy of Bimetallic Materials. J. B. Mohler. *Iron Age,* v. 174, Sept. 2, 1954, p. 106-107.
Measurements of bond strength after heating gives progress of bond deterioration. Successful results on aluminum on steel bearings. Table, graph, diagram. 3 ref. (L22, ST, Al)

797-L. HAE Coating Variations. Harry A. Evangelides. *Magnesium,* 1954, Aug., p. 5-6.
Properties of coating for magnesium. Graph, photographs. (L14, Mg)

798-L. Metal Cleaning. K. G. Lewis. *Metal Treatment and Drop Forging,* v. 21, Aug. 1954, p. 377-386.
Mechanical methods. Evaluation of peening and liquid honing. Photographs, micrographs, diagrams. 27 ref. (L10, G19, G23)

799-L. Oxidation Resistance of Diffusion Coatings on Sintered and Swaged Molybdenum Wire. C. J. Leadbeater and D. T. Richards. *Metal Treatment and Drop Forging,* v. 21, Aug. 1954, p. 387-396.
Factors influencing protection of wire at high temperatures. Graphs, tables, micrographs. 1 ref. (L15, R2, Mo)

800-L. Bi-Metallic Casting Cuts Weight. *Metal-Working,* v. 10, Sept. 1954, p. 10-11.
Fer-Mag process of bonding cast magnesium to steel. Photograph, micrograph. (L22, Mg, ST)

801-L. Protection of Steel. II. Primer Coats. Martin E. Schleicher. *Paint Industry Magazine,* v. 69, Aug. 1954, p. 21-23.
Special functions of primer coats, selection of vehicles and pigments. Table, diagram. (L26, ST)

802-L. Coating Wire Products With Plastics. *Plastics,* v. 19, Aug. 1954, p. 261-262.
Progress in dip coating wire products with polythene and polyvinyl chloride. Photographs. (L26)

803-L. Organic Finishes on Electroplate Coatings With Special Reference to Adhesion. E. C. J. Marsh. (Condensation of *Institute of Metal Finishing, Transactions, Advance Copy no.* 22, 1954.) *Products Finishing,* v. 18, Sept. 1954, p. 24 + 17 pages.
Uses and advantages of dual coatings to satisfy service requirements of electrical communications equipment. Photographs, tables. (L26)

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Zinc plating process and installation. Photographs, diagram. (L16, L17, ST, Zn)

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Equipment and operating procedures for acid and alkali wastes. Flowsheet, plant layout, tables. (L17, A8)

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Wear problems solved by coatings of tungsten carbide deposited on surfaces of parts and tools. Photographs. (L24, W)

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Salts are adsorbed in the aluminum by maintaining the anodized piece for a period of time in a concentrated solution of the salts. 6 ref. (L19, Al)

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Advantages of phosphating in the anticorrosive protection of iron. (L14, Fe)

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Process of producing wear resisting surfaces on cast iron and steel. (L15, CI, ST)

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Studies of the evolution of the barrier layer during the early stages of the formation of a porous type coating on aluminum. Diagrams, graphs, table. 6 ref. (L19, Al)

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Processes, details of practical operation and variations of coating properties. Graphs, diagram. (To be continued.) (L19, Al)

832-L. Engineering Applications of Barrel Finishing. *Electroplating and Metal Finishing,* v. 9, Sept. 1954, p. 339-340.

Equipment, processing and applications. Photographs, diagram, graph, micrographs. (L10)

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An *in situ* process using sea-water electrolyte. (L13, ST)

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Recent developments in use and application of enamels on steel and cast iron. (L27, CN, CI)

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Twenty-foot temporary extension on 26-ft. permanent pot allows steel girders up to 46 ft. long to be zinc coated in one trip. Photographs. (L16, CN, Zn)

836-L. Metallizing Solves Wear Problem. Don Borden. *Industry and Power,* v. 67, Sept. 1954, p. 72-73.

Paper mill digesters are metallized with type 304 stainless. Photographs. (L15, SS)

837-L. Defects in Vitreous-Enamelled Iron Castings. E. R. Evans. *Institute of British Foundrymen, Paper no.* 1096, 1954, 12 p.

Causes of defective enamel coatings, mechanism of blister gas formation and possibilities of eliminating various defects. Micrographs, diagrams, table. 6 ref. (L27, CI)

838-L. Custom-Built Plating Machine Brings Plant to Peak Efficiency. J. J. Obrzut. *Iron Age,* v. 174, Sept. 23, 1954, p. 120-122.

Features of automatic machine

for chromium plating of automotive parts. Photographs, diagram. (L17, Cr)

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Factors contributing to efficient operation. (L10, L12)

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Includes "Thermal Factors Affecting Output in Sheet and Strip Galvanizing", J. Landeau and "An Italian Design for an Improved Galvanizing Furnace", A. Celli. (L16)

843-L. Automatic Zinc Plating. C. E. Fisher and D. F. Zlatnik. *Metal Progress,* v. 66, Sept. 1954, p. 107-112.

Equipment and techniques for plating steel for cartridge cases. Photographs, table, diagram. (L17, Zn, CN)

844-L. Vitreous Enameling Keeps Pace With Production Practices. (Digest of "Porcelain Enamel: Its Use and Manufacture for Household Appliances", by Wilbur H. Pfeiffer; *General Motors Engineering Journal,* v. 1, no. 6, May-June 1954, p. 8-13.) *Metal Progress,* v. 66, Sept. 1954, p. 146, 148, 150.

Composition, application and properties of porcelain coatings. (L27, CN)

845-L. How to Paint Aluminum. *Modern Metals,* v. 10, Sept. 1954, p. 42 + 5 pages.

Proper procedures and materials for decorative and protective coatings. Photographs, flow chart. (L26, Al)

846-L. Some Considerations of Importance in Ball Burnishing. Arthur S. Kohler. *Plating,* v. 41, Sept. 1954, p. 1013-1017.

Various factors of material importance in determining final quality of work. Photographs, diagrams. (L10)

847-L. Nickel Plating From the Sulfamate Bath. Richard C. Barrett. *Plating,* v. 41, Sept. 1954, p. 1027-1032; disc., p. 1033.

Desirable physical properties account for increase in use of process. Tables, graphs. 29 ref. (L17, Ni)

848-L. An Electrochemical Method for Evaluating Plated Coatings. W. J. Pierce and W. L. Pinner. *Plating,* v. 41, Sept. 1954, p. 1034-1042; disc., p. 1042.

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Application, defects, baking and salvaging of rejects. Photographs. (L27, Zn)

850-L. Mechanical Properties of Aluminum Hard Coatings. Henry A. Johnson. *Product Engineering,* v. 25, Sept. 1954, p. 136-141.

Increased hardness and wear resistance reduce fatigue resistance and tensile strength, thereby influencing design. Photographs, tables, graphs. (L general, Q general, Al)

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Details of new installation. Photographs. (L12, ST)

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A metallic granulated substance replaces the sand in sand-blasting and its advantages. Table, photograph. (L10, Al)

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Accurate electrochemical method of determining thickness and phases of zinc coatings applied by hot dipping. Diagrams, micrographs, graphs. 16 ref. (L16, Zn)

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Chemical testing for qualitative evaluation. Diagrams, tables, photograph. 3 ref. (L27, Al)

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Most successful method involves use of ferritic and austenitic weld metal. Photographs, micrographs, graphs. (L24, CI, SS)

867-L. (German.) **Repair of Gray and Chilled Cast Iron Rolls by Welding.** Karl Scholl. *Stahl und Eisen,* v. 74, no. 18, Aug. 26, 1954, p. 1142-1144.
Repair of worn roll necks by deposition welding. Photographs, diagrams. 2 ref. (L24, CI)

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Ceramic coating contributes properties not otherwise attainable. Photograph. (L27, Al)

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Types, treatment and disposal of effluents. Photographs. 7 ref. (L general, A8)

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Flat transducer, driven at high

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Replica finishing or coating processes eliminated. Final mirror coatings prepared directly on master mold. Method applicable to plastic and electroformed metal reproductions. Diagrams. 4 ref. (L18)

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Pack and gas diffusion coating, effects on hardening, microstructure, corrosion and heat resistance. Micrographs, graphs, tables. 4 ref. (L15, Be, ST)

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Coverage of every phase of spraying porcelain enamel upon base metal from gun development to atomization; effect of mal-practices; performance of equipment; methods of obtaining atomization. (L27)

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Experimental data on effects of processing variables on obtaining alloys of different compositions. Graphs. 8 ref. (L17, Cd, Zn)

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Equipment and techniques for plating on cast iron. Diagram, table. 12 ref. (L17, Cr, CI)

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New ceramic coatings developed at Armour Research Foundation. Spraying used to apply ceramic solutions to heated surfaces. Remarkable resistance to thermal shock, excellent adherence, and high corrosion resistance are promising properties of inorganic solutions. Extensive applications seen in refractories and enameling fields. Photograph, table. (L27)

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Coatings tested for resistance to cyclic vibration, wetting, drying, heating and combinations of these conditions. Photographs. (L27)

898-L. Application Techniques, Physical Characteristics and Chemical Resistance of Polyvinyl Chlor-Acetates. *Corrosion,* v. 10, Oct. 1954, p. 349-354.

General considerations of organic coatings and specific data on properties and variables influencing their efficiency. Tables. 2 ref. (L26)

899-L. Anti-Corrosive Paints for Ships. II. J. C. Kingcome. *Corrosion Prevention and Control,* v. 1, Sept. 1954, p. 411-417.

Selection of primer and protective coats and special problems. Photographs. 12 ref. (L26)

900-L. Factors Affecting the Formation of Anodic Oxide Coatings. M. S. Hunter and P. Fowle. *Electrochemical Society, Journal,* v. 101, Oct. 1954, p. 514-519.

Effects of electrolyte and other variables. Graphs. 10 ref. (L19)

901-L. Cameo Is Enameling Aluminized Steel. Gilbert C. Close. *Finish,* v. 11, Oct. 1954, p. 40-41.

Advantages and applications of low-temperature frit to "aluminized" steel sheet material. Photographs. (L27, Al, ST)

902-L. Cleaning and Polishing Heat-Exchanger Parts. Raymond H. Spiotta. *Machinery,* v. 61, Oct. 1954, p. 160-164.

Grinding, polishing, buffing and electropolishing stainless steel food processing equipment. Photographs. (L10, L13, G18, SS)

903-L. Barrel Finishing Precision Machined Airframe Components. *Machinery (London),* v. 85, Sept. 17, 1954, p. 595-602.

Techniques employed by Vickers-Armstrongs for removal of tool lines and blending of surface defects. Photographs. (L10)

904-L. Titanium and Zirconium Cladding. J. E. Hughes. *Metal Treatment and Drop Forging,* v. 21, Sept. 1954, p. 431-432, 430.

Two methods, examples and applications in industry. Diagram. 6 ref. (L22, Ti, Zr)

905-L. Ceramic Coatings for Use in Nuclear Reactors. *National Bureau of Standards, Technical News Bulletin,* v. 38, Oct. 1954, p. 150-152.

Compositions, application techniques and properties of coatings for high-temperature protection for shields, moderators and fuel rods. Photographs, tables. 8 ref. (L27)

906-L. Good Results From Field Hardfacing. C. Swartsfager. *Oil and Gas Journal,* v. 53, Oct. 11, 1954, p. 150-152.

Hard surfacing equipment and procedures in the rock-drilling industry. Photographs. (L24, ST)

907-L. Stress Effect of Iron Contamination in a Watts Type Nickel Plating Solution and Its Correlation With Endurance Limit. L. H. Curkin and R. W. Moeller. *Plating,* v. 41, Oct. 1954, p. 1154-1157; disc., p. 1157-1158.

Contractometer and interferometer measurements correlated with fatigue limits of nickel-plated alloy steel specimens. Photograph, diagram, table, graphs. 3 ref. (L17, Q7, AY, Ni)

908-L. Copper-Tin Alloy Plating. W. H. Safranek and C. L. Faust. *Plating,* v. 41, Oct. 1954, p. 1159-1164, 1169-1170; disc., p. 1170.

Alloys with 17 to 50% tin show good leveling action and corrosion resistance. Tables, micrographs, photographs. 13 ref. (L17, Cu, Sn)

909-L. Equipment for the Study of Electrodeposition on Oxide-Soiled Surfaces. Henry B. Linford and David O. Feder. *Plating,* v. 41, Oct. 1954, p. 1183-1187.

Equipment and techniques for studying plating phenomena under closely controlled conditions. Table, photographs, diagrams. 5 ref. (L17)

910-L. Electropolishing Titanium. Sakae Tajima and Takemi Mori. *Products Finishing,* v. 19, Oct. 1954, p. 26-30, 32.

Bath compositions and operating procedures. Diagrams, tables. 4 ref. (L13, Ti)

911-L. Gas-Fired Pot Improves Galvanizing Operations. Arthur Q. Smith. *Products Finishing,* v. 19, Oct. 1954, p. 38-40, 42, 44.

Furnace and operating procedures. Photograph, diagram, chart. (L16, Zn)

912-L. Glass Pipe and Fittings. C. Fred Gurnham. *Products Finishing,* v. 19, Oct. 1954, p. 58 + 5 pages.

Chemical resistance and other properties of glass and advantages of use in electroplating industry. Photographs. (L17)

913-L. Dip Valves for Higher Performance. *Steel,* v. 135, Oct. 11, 1954, p. 114-115.

Process of coating automobile engine valves with aluminum to provide much longer service life. Photographs. (L16, Al, AY)

914-L. Improvement of Surface Finish of Ground Work Pieces by Electrolytic Polishing and Relationship Between Surface Finish & Mechanical Properties. J. Heyes. *Henry Brutcher, Altadena, Calif., Translation no.* 3335, 9 p. (From *Metalloberfläche,* v. 3, no. 12, 1951, p. B177-B179.)

Previously abstracted from original. See item 354-L, 1952. (L13, Q7, CN, AY)

915-L. Comparative Studies of Polishing Action of Phosphoric-Sulfuric and Acetic-Perchloric Acid Electrolytes. J. Heyes. *Henry Brutcher, Altadena, Calif., Translation no.* 3336, 8 p. (From *Metalloberfläche,* v. 3, no. 12, 1951, p. B179-B181.)

Previously abstracted from original. See item 355-L, 1952. (L13, CN)

916-L. Surface Impregnation of Steel With Vanadium. A. N. Minkevich. *Henry Brutcher, Altadena, Calif., Translation no.* 3345, 4 p. (From book *"Surface Impregnation of Steel",* Chapter XIII. Published by Mashgiz, Moscow, 1950.)

Effect of impregnation time in ferrovanadium powder upon case depth of vanadized iron. Microstructure and hardness. Tables, micrographs, graph. (L15, M27, Q29, V, ST)

917-L. Surface Impregnation of Steel With Nickel, Cobalt, Titanium, Zirconium, Tantalum, and Manganese. A. N. Minkevich. *Henry Brutcher, Altadena, Calif., Translation no.* 3346, 8 p. (From book *"Surface Impregnation of Steel",* Chapter XIV. Published by Mashgiz, Moscow, 1950.)

Russian data on surface impregnation of steel with more than one metallic element at a time. Graph. 7 ref. (L15, Ni, Co, Ti, Zr, Ta, Mn, ST)

918-L. (English.) **The Anodic Oxidation of Uranium.** O. Flint, J. J. Polling and A. Charlesby. *Acta Metallurgica,* v. 2, no. 5, Sept. 1954, p. 696-712.

Rates of oxidation and structures of films from 2 to 100 v. Similarities of anodic and thermal oxidation. Tables, graphs, electron diffraction patterns. 13 ref. (L19, R2, U)

919-L. (German.) **Aluminizing Grate Bars.** E. Kammeier. *Energietechnik,* v. 4, no. 8, Aug. 1954, p. 368-369.

Outlines operations of aluminizing grate bars as effective and economical method of prolonging service life. Photographs, micrographs. 5 ref. (L16, Al)

920-L. (German.) **Further Development of the Technique of Metal Spraying.** Hans Reininger. *Metalloberfläche,* Ausgabe B, v. 6, no. 9, Sept. 1954, p. 131-135.

Recent literature on use of sprayed metal coatings to prevent rusting of ferrous metals. Photographs, table. 43 ref. (To be continued.) (L23)

921-L. (German.) **Coatings of Rubber and Plastics as a Protection of Metals.** H. Anders. *Metalloberfläche,* Ausgabe A, v. 8, no. 9, Sept. 1954, p. 142.

Properties of rubber and plastic coatings. (L26)

922-L. (German.) **Controlling the Properties of Ground-Coat Enamel on Sheet Metal.** K. P. Asarow. *Silikattechnik,* v. 5, no. 8, Aug. 1954, p. 347-348.

Behavior of boron-containing and boron-free ground-coat enamels on sheet steel. Correlation of enamel composition to its properties. Graphs. 13 ref. (L27)

923-L. (Russian.) **Problem of the Composition and Mechanism of Formation of a Film on Iron Obtained by Caustic Burnishing.** I. V. Krotov. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 7, July 1954, p. 1327-1330.

Film formation as function of time and temperature. Graphs. 4 ref. (L10, Fe)

924-L. **The Story of Shipbottom Protective Coatings.** W. J. Francis. *Bureau of Ships Journal,* v. 3, Oct. 1954, p. 22-25.

Early research history, present uses and future prospects for hot plastic and quick-drying vinyl coatings. Photographs. (L26)

925-L. **Chelating Agents in Electroplating.** C. D. Leonard. *Electroplating and Metal Finishing,* v. 7, Oct. 1954, p. 365, 367, 369-370.

Chemical principles and applications. Tables, graphs. 6 ref. (L17)

926-L. **The Electrodeposition and Protective Value of Zinc-Cadmium Alloys.** N. I. Kudryavtsev and E. F. Pereturina. *Electroplating and Metal Finishing,* v. 7, Oct. 1954, p. 372-375. (From *Zhurnal Prikladnoi Khimii SSSR,* v. 26, no. 2, 1953, p. 155-159.)

Previously abstracted from the original. See item 139-C, 1953. (L17, R general, Zn, Cd)

927-L. **Hard Anodising of Aluminium and Its Alloys.** A. W. Brace. *Electroplating and Metal Finishing,* v. 7, Oct. 1954, p. 376-379.

Processes, practical applications and variations of coating properties. Tables, photographs. 18 ref. (L19, Al)

928-L. **Nickel Plating From Sulphamate Baths.** Myron B. Diggin. *Metal Progress,* v. 66, Oct. 1954, p. 133-137.

Nickel plated from sulphamate-chloride solutions containing an organic addition agent has compressive internal stresses, high tensile strength, and hardness without brittleness. Possible applications. Micrographs, tables, graphs. (L17, Ni)

929-L. **Organic Finishes on Plated Surfaces.** *Organic Finishing,* v. 15, Sept. 1954, p. 11-14.

Coating problems with zinc, cadmium, copper, tin, nickel, chromium, silicon and gold plate. Table. (L26, Zn, Cd, Cu, Sn, Ni, Cr, Ag, Au)

930-L. **Butyl Titanate Heat and Corrosion Resistant Paints.** George W. Grupp. *Organic Finishing,* v. 15, Sept. 1954, p. 15-16.

Polymerization of buytl titanate; formulations and additives. (L26)

931-L. **Cleaning of Stainless Steel for Wire Drawing.** John H. Corson. *Wire and Wire Products,* v. 29, Oct. 1954, p. 1143-1144, 1146-1147.

Factors involved in make-up of oxidized surfaces and industrial cleaning practices. Tables, micrographs, photograph. 4 ref. (L12, F28, SS)

932-L. (Italian.) **Modern Varnishes.** Luciano Colombo. *Illustrazione Scientifica,* v. 6, no. 58, Sept. 1954, p. 20-25.

Preparation of iron surfaces, wash primers, under-water and anticorrosive vinyl paints and uses of vinyl and acrylic polymers in paint. Photographs. (L26)

933-L. (Polish.) **Coating of Steel by Aluminium Diffusion.** E. Gasior. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 4, 1954, p. 200-209.

Properties of aluminum-iron coatings on steel. Coating methods, in-

cluding Alitizing. Graphs, tables, diagrams, photographs. 28 ref. (L15, Al, ST)

934-L. Asphalt Emulsions as Protective Coatings. C. C. Weeks. *Chemistry in Canada,* v. 6, Oct. 1954, p. 33-37.
Nature, properties, applications and benefits of the emulsions in industry. Photographs. (L26)

935-L. Growth of Nickel Flashing—and Its Proper Control. J. J. Canfield. *Finish,* v. 11, Nov. 1954, p. 37 + 5 pages.
Effect of thin film of chemically deposited nickel on adherence of porcelain enamel. Flashing equipment and procedures. Photographs, micrographs, graphs. 16 ref. (L14, L27, Ni)

936-L. Flow Coat Priming. C. O. Hutchinson. *Finish,* v. 11, Nov. 1954, p. 43-44, 80-81.
Flow coating methods and equipment. Photographs. (L26)

937-L. Defects in Vitreous-Enamelled Iron Castings. E. R. Evans. *Foundry Trade Journal,* v. 97, Oct. 7, 1954, p. 421-425.
Types of defects and causes. Micrographs, diagram, table. 4 ref. (To be continued.) (L27, CI)

938-L. Lockheed's New Setup for Treating Aluminum Parts. W. F. Castell. *Industrial Finishing,* v. 30, Oct. 1954, p. 54 + 5 pages.
Principle and advantages of a chromate conversion process for corrosion prevention. Photographs. (L14, Al)

939-L. Electrodeposition of Tin Alloys. J. W. Cuthbertson. *Industrial Finishing (London),* v. 7, Oct. 1954, p. 176-183, 191.
Tin-zinc, tin-nickel, tin-cobalt and tin-antimony alloys described. Photographs, tables, diagram. 11 ref. (L17, Sn, Zn, Ni, Co, Sb)

940-L. Electrolytic Nickel-Clad Plate Offers Low-Cost Corrosion Protection. S. G. Bart. *Iron Age,* v. 174, Oct. 28, 1954, p. 87-89.
Properties and uses of 0.006 to 0.020-in. coatings on mild steel plate. Photographs, micrograph. (L17, Ni, CN)

941-L. Properties of Ceramic-Coated Metals. Burnham W. King. *Materials & Methods,* v. 40, Oct. 1954, p. 104-106.
Preparation, firing, chemical resistance, mechanical properties and applications outlined. Photographs, graph. 6 ref. (L27)

942-L. The Role of Cyanide Neutralization in the Surface Treatment of Steel. J. H. Peterson, G. M. Nichols and W. F. McDevit. *Metal Finishing,* v. 52, Oct. 1954, p. 62-64.
Carbon-14 used to determine amount of cyanide retained on pickled steel. Corrosion resistance of cleaned sheets. Tables. 2 ref. (L12, R general, S19, CN)

943-L. Chrome Plating of Gun Bores. C. Fred Gurnham. *Products Finishing,* v. 19, Nov. 1954, p. 56 + 4 pages.
Process for 90 mm. x 15-ft gun barrel from receipt to final finishes. (L17, Cr)

944-L. Finishes for Metals. Robert A. Wason. *Tool Engineer.* v, 33, Nov. 1954, p. 111-118.
Properties of organic finishes. Photographs. (L26)

945-L. On the Corrosion Resistance of Hard Chromium Plates. H. W. Dettner. *Henry Brutcher, Altadena, Calif., Translation no.* 2573, 12 p. (From *Metalloberfläche,* v. 4, no. 3, 1950, p. A33-A37.)
Previously abstracted from original. See item 292-L, 1950 (L17, R general, Cr)

946-L. Influence of Thiourea on the Electrodeposition of Nickel. L. I. Antropov and S. Ya. Popov. *Henry Brutcher, Altadena, Calif., Translation no.* 3379, 6 p. (From *Zhurnal Prikladnoi Khimii,* v. 27, no. 2, 1954, p. 206-209.)
Previously abstracted from original. See item 477-L, 1954. (L17, Ni)

947-L. (French.) **Protection Against Corrosion of Pressure Pipe Lines.** Robert Bouchayer. *Ossature métallique,* v. 19, no. 10, Oct. 1954. p. 477-484.
Properties, application, and advantages of bituminous coatings. Photographs, chart. (L26)

948-L. (French.) Producing a Smooth Surface on an Oxide Cathode by Atomization and Measuring Its Roughness. Y. Nakamura, S. Okada and Y. Kato. *Vide,* v. 9, no. 51, May, 1954. p. 75-80.
Electrostatic application of oxide coatings with precision of 1 to 2 μ. Diagrams, table, graphs, micrographs. 5 ref. (L14, S15)

949-L. (French.) **Problems Raised by Coating Oxide Cathodes by Atomization.** J. Schweitzer. *Vide,* v. 9, no. 51, May, 1954, p. 81-89.
Study of colloid techniques, adherence, choice of bonding material. Tables, graphs, diagrams. 11 ref. (L14)

950-L. (German.) **Defects on Zinc-Plated Sheet Metals.** Hans-Joachim Wiester and Dietrich Horstmann. *Metalloberfläche,* Ausgabe B, v. 6, no. 10, Oct. 1954, p. 145-151.

Various causes of defective zinc coatings. Photographs, micrographs. 14 ref. (L16, L17, Zn)

951-L. (German.) **Electrolytic Zinc Coatings and Their Subsequent Treatment.** Heinz W. Dettner. *Metalloberfläche,* Ausgabe B, v. 6, no. 10, Oct. 1954, p. 151-155.

Review of literature on effects of bath composition, temperature, and other operating conditions on electrolytic efficiency. Graphs. 68 ref. (L17, Zn)

952-L. (German.) **On the Uniform Deposition of Zinc by Pot Galvanizing.** F. Sautter. *Metalloberfläche,* Ausgabe B, v. 6, no. 10, Oct. 1954, p. 156-157.

Methods of improving uniformity of zinc coatings and of reducing zinc consumption without impairing quality. 3 ref. (L16, Zn)

953-L. (German.) **Zinc Coating and Painting.** Wilhelm Brachmann. *Metalloberfläche,* Ausgabe A, v. 8, no. 10, Oct. 1954, p. 157-160.

Protecting effect of zinc coatings on iron, advantages of combining zinc coating with paint. Diagrams, graph, tables. (To be continued.) (L16, L26, Zn, CN)

954-L. (German.) **Pointers on the Preparation of Titania Cover Coat Enamel.** Rudolf Märker. *Silikattechnik,* v. 5, no. 9, Sept. 1954, p. 385-386.

Development of enamel for kitchen utensils and household equipment which has good impact strength, acid resistance, and resistance to temperature changes. Tables. (L27)

955-L. (German.) **Titania Single-Coat Enamel for Steel.** Armin Petzold and Helmut Betzer. *Silikattechnik,* v. 5, no. 9, Sept. 1954, p. 387-388.

Review of current research developments. Photograph. (L27, ST)

956-L. (Russian.) **Microscopic Observation of the Anode Process During Electrolytic Polishing of Duralumin.** A. Sh. Valeev. *Zhurnal Prikladnoi Khimii,* v. 27, no. 9, Sept. 1954, p. 939-944.

In mixture of sulfuric, phosphoric and chromic acids, formation of film in anodal zone and adsorption by polished surface. Diagram. 13 ref. (L13, Al)

957-L. (Russian.) **Influence of Impurities on Electrolytic Deposition of Copper From a Pyrophosphate Electrolyte.** E. A. Ukshe and A. I. Levin. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 8, Aug. 1954, p. 1434-1438.

Influence of lead and iron cations and halides. Tables, graphs. 8 ref. (L17, Cu)

958-L. (Book.) **Galvanising Techniques in the U.S.A. Technical Assistance Mission No. 78.** 132 p. Organisation for European Economic Co-operation, 2 rue André-Pascal, Paris, France. 9/.

High-speed continuous galvanizing of sheet and tube. Lead-zinc and insoluble anode processes. Zinc electro-deposition on strip. Herman wire galvanizing. (L16, Zn)

959-L. (Book.) **Metallic Coatings on Non-Metallic Materials. Silver Films.** Report no. PB 111236. v. I. 138 p. 1954. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $2.00.

Survey of general methods of metal coating and details of silver mirror making. (L general, Ag)

960-L. (Book.) **Metallic Coatings on Non-Metallic Materials. Copper Films.** Report no. PB 111237. v. II. 37 p. 1954. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $1.00.

Thermal and chemical methods of depositing copper on nonmetallic surfaces. (L general, Cu)

961-L. (Book.) **Metallic Coatings on Non-Metallic Materials. Nickel Films.** Report no. PB 111330. v. III. 14 p. 1954. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $1.00.

Thermal and chemical processes for nickel deposition. (L general, Ni)

962-L. (Book.) **Metallic Coatings on Non-Metallic Materials. Lead Sulfide Films.** Report no. PB 111331. v. IV. 19 p. 1954. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $1.00.

Various processes; applications in mirrors, electrical resistance elements, planographic arts, rectifiers, detectors, and light-sensitive cells. (L general, Pb)

963-L. (Book.) **Metallic Coatings on Non-Metallic Materials. Gold Films.** Report no. PB 111332. v. V. 17 p. 1954. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $1.00.

Deposition of films on glass, textiles, bakelite, and wood. (L general, Au)

964-L. (Book.) **Metallic Coatings on Non-Metallic Materials. Mechanical Films.** Report no. PB 111333. v. VI. 21 p. 1954. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $1.00.

Methods of applying powdered metals on non-conductors. (L general, H general)

965-L. (Book.) **Metallic Coatings on Non-Metallic Materials. Metallic Paints for Printed Electronic Circuits and Other Uses.** Report no. PB 111334. v. VII. 30 p. 1954. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $1.00.

Paints, fluxes, and application methods. List of precious metal suppliers. (L general, T1)

966-L. (Book.) **Metallic Coatings on Non-Metallic Materials. Vacuum Coating Methods.** Report no. PB 111335. v. VIII. 22 p. 1954. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $1.00.

Modern evacuation methods for commercial vacuum coating in the electronics, optical, and decorative fields. (L25)

967-L. (Book.) **Metallic Coatings on Non-Metallic Materials. Applications of Metal Films on Commercial Products.** Report no. PB 111336. v. IX. 29 p. 1954. Office of technical Services, U. S. Dept. of Commerce, Washington, D. C. $1.00.

Materials and end uses of products upon which metal films have been formed. (L general)

968-L. (Book.) **Second International Conference on Hot Dip Galvanizing.** 236 p. Zinc Development Association, Lincoln House, Turl St., Oxford, England. 37s. 6d.

Papers include discussion of flaking which occurs when certain kinds of coating are bent; electrochemical behaviour in contact with hot water of iron-zinc alloy layer; effect of aluminum and iron on structure of galvanized coatings; requirements of bath; economics of process; and others. (L16, Zn)

SECTION M

METALLOGRAPHY, CONSTITUTION and PRIMARY STRUCTURES

1-M. Constitution of the Copper-Rich Copper - Aluminum - Germanium Alloys. G. V. Raynor and P. Greenfield. *Institute of Metals, Journal,* v. 82, Oct. 1953, p. 59-64.

Examination by metallographic and X-ray methods at 700, 600 and 550° C. Diagrams, tables, 6 ref. (M24, Cu, Al, Ge)

2-M. The Copper-Indium Eutectoid at 31.36 Wt.-% Indium. Chester W. Spencer and David J. Mack. *Institute of Metals, Journal,* v. 82, Oct. 1953, p. 81-85 + plates XIV, IV.

Experimental work undertaken to determine structure. Graphs. 8 ref. (M24, Cu, In)

3-M. The Free-Energy Diagram of the System Titanium-Oxygen. O. Kubaschewski and W. A. Dench. *Institute of Metals, Journal,* v. 82, Oct. 1953, p.87-91.

Experimental procedure to obtain data in order to construct free energy concentration curves of Ti-O system. Tables, diagram. 15 ref. (M24, P12, Ti)

4-M. Standard X-Ray Diffraction Powder Patterns. v. 1. Data for 54 Inorganic Substances. Howard E. Swanson and Eleanor Tatge. *National Bureau of Standards Circular* 539, June 15, 1953. 95 p.

Sets of patterns in the National Bureau of Standards file for 16 pure metals and 38 inorganic substances reviewed with the object of supplanting them with single standard patterns. Tables. 264 ref. (M22, Mg, Al, Ni, Cu, Zn, Ge, Mo, Pd, Ag, Sn, Te, W, Ta, Pt, Au, Pb)

5-M. Electron Microscopic Observation of 111 Faces of ZnS Crystals. W. Dekeyser, S. Amelinckx, E. Votava and G. Vandermeerssche. *Philosophical Magazine,* v. 44, 7th ser., no. 357, Oct. 1953, p. 1142-1144.

Growth fronts and slip lines. 6 ref. (M21, M26, Q24, Zn)

6-M. Metallic Carbides and Nitrides of the Type MX. William Hume-Rothery. *Philosophical Magazine,* v. 44, 7th ser., no. 357, Oct. 1953, p. 1154-1160.

Face-centered cubic arrangement with metal atoms is favored because it provides metallic atoms with mutually perpendicular bonds to six neighbors. Tables. 10 ref. (M26)

7-M. (German.) **Formation of Metallic Properties in Ionic and Valence Lattices.** H. Krebs. *Naturwissenschaften,* v. 40, no. 20, 1953, p. 525-526.

Examples to show that the width of the forbidden zone in crystals decreases with increasing resonance between *p*-electrons to form metallic conductors. Diagrams. 9 ref. (M26)

8-M. (German.) **X-Ray Studies of Titanium Nitride and Titanium Carbide Surface Coatings.** A. Münster and K. Sagel. *Zeitschrift für Elektrochemie,* v. 57, no. 7, 1953, p. 571-579.

Determination of lattice constants. X-ray methods of measuring film thickness and the phenomena of oriented crystal growth in titanium nitride films. Tables, graphs, micrographs. 22 ref. (M26, Ti)

9-M. Solidification of Steel. II. Structure, Segregation, and Non-Metallic Inclusions. T. B. King. *Iron & Steel,* v. 26, Nov. 1953, p. 513-520.

Reviews cast structure; theory and factors affecting segregation; and types, size, distribution and effects of inclusions. 95 ref. (M27, M28, N12, ST)

10-M. The Habit Plane of Beta in Alpha Titanium. Paul A. Albert. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1449-1450.

Experimental procedure to determine the above and method of analysis. Photographs, diagram. 4 ref. (M26, Ti)

11-M. The Silver-Cadmium Beta and Zeta Phases. L. Muldawer, M. Amsterdam and F. Rothwarf. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Minning and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1458-1459.

X-ray diffraction studies on beta-prime region of the system. Table, graph. 8 ref. (M22, M24, Ag, Cd)

12-M. Neptunium-Aluminum Intermetallic Compounds. O. J. C. Runnalls. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1460-1462.

X-ray diffraction methods were used to study above. Tables, diagrams, photograph. 7 ref. (M22, M26, Np, Al)

13-M. Titanium-Rich Regions of the Ti-C-N, Ti-C-O, and Ti-N-O Phase Diagrams. L. Stone and H. Margolin. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1498-1502.

Studies in the above. Diagrams, photographs, table. 10 ref. (M24, Ti)

14-M. The Molybdenum-Boron System. Paul W. Gilles and Bernard D. Pollock. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1537-1539.

Studies in phase diagram at high temperatures. Diagram, table. 3 ref. (M24, Mo, B)

15-M. The Partition of Some Alloying Elements Between Carbide and Ferrite in Steels. D. A. Scott and G. S. Farnham. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1541-1543.

Studies in the above. Reports partition of one element is not much affected by presence of another. Tables. 7 ref. (M26, ST, Ni, Mn, Mo, Cr)

16-M. System Titanium-Chromium-Molybdenum. R. P. Elliott, B. W. Levinger and W. Rostoker. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1544-1549.

Studies in phase equilibria of the above. Table, diagrams, graphs. 12 ref. (M24, Ti, Cr, Mo)

17-M. Metallographic Structures in Commercial Titanium. Roman Osadchuk, William P. Koster and John F. Kahles. *Metal Progress,* v. 64, Nov. 1953, p. 93-96.

Etching, heat tinting and phase identification. Micrographs. (M21, M27, Ti)

18-M. Metallography of Highly Radioactive Materials. M. J. Feldman. *Metal Progress,* v. 64, Nov. 1953, p. 97-102.

Equipment and procedures for specimen preparation and examination by remote control. Photographs, micrographs. (M21, EG-h)

19-M. Stable Dislocations in the Common Crystal Lattices. E. C. Frank and J. F. Nicholas. *Philosophical Magazine,* v. 44, 7th ser., no. 358, Nov. 1953, p. 1213-1235.

On the assumption that the energy per unit length of a dislocation line is proportional to the square of the Burgers vector, the stability of dislocations in simple cubic, face-centered cubic, diamond, hexagonal close-packed and body-centered cubic lattices is discussed. Diagrams, tables. 5 ref. (M26)

20-M. Formation of Sigma Phase in the Mn-Mo System. B. F. Decker, R. M. Waterstrat and J. S. Kasper. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1476.

Two methods of preparation. Tables. 3 ref. (M26, Mo, Mn)

21-M. (English.) **Light Figures of Bismuth Single Crystals and the Determination of Their Crystal Orientations by the Light-Figure Method. II. Light Figures. III. Orientation Determination by Light Figures.** Mikio Yamamoto and Denjiro Watanabé. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 2, Apr. 1953, p. 124-146.

Light figures produced by etching with various reagents observed and crystal orientations determined. Diagrams, photographs, tables. 4 ref. (M21, M26, Bi)

22-M. (English.) **Electron Diffraction Study on the Selective Oxidation of Copper-Aluminium Alloys.** Denjiro Watanabe, Shiro Ogawa and Takashi Kimura. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 3, June 1953, p. 238-253.

Oxide films on alloys containing 1 to 10% aluminum. Attempts made to correlate the nature of films, the treatment temperature and discoloration resistance to various acids. Tables, graphs, diagrams. (M22, Cu, Al)

23-M. How to Tell a Good High Speed Tool When You See One in a Microscope. Michael J. Antus and Birger L. Johnson. *Steel,* v. 133, Nov. 23, 1953, p. 88-89.

Micrographs showing distribution of carbides, heat treated structure, surface condition and austenitic grain size. (M27, TS)

24-M. (Czechoslovakian.) **Investigation of Nonmetallic Inclusions in Steel.** Miroslav Sicha. *Hutnické Listy,* v. 8, no. 10, Oct. 1953, p. 506-512.

Samples were prepared and inclusions examined by chemical analysis, X-ray diffraction and metallographic techniques. Diagrams, graphs. (To be continued.) (M21, M22, S11, ST)

25-M. (Russian.) **"Dew" Method as Applied in the Investigation of Spiral Step Growth.** N. V. Gliki. *Doklady Akademii Nauk SSSR,* v. 90, no. 4, June 1, 1953, p. 541-543.

A jet of warm moist air directed against carefully cleaned surface causes small changes in the contours to stand out in relief. Micrographs. 7 ref. (M23)

26-M. (Russian.) **Basic Types of Constitution Diagrams of Titanium-Base Binary Systems.** I. I. Kornilov. *Doklady Akademii Nauk SSSR,* v. 91, no. 3, July 21, 1953, p. 549-552.

Position in the periodic system of titanium and its alloying elements and similarity or differences of their chemical properties determine characteristics of their interactions and consequently the types of phase diagrams. Graphs. 16 ref. (M24, Ti)

27-M. (Russian.) **Calculation of the Intensity of Diffuse X-Ray Dispersion of Various Degrees of Order in the Position of Defects in Crystals.** Iu. A. Bagariatskii. *Doklady Akademii Nauk SSSR,* v. 92, no. 6, Oct. 21, 1953, p. 1157-1160.

Problem of diffuse X-ray dispersion on a one-dimensional case when positions of defects in crystal are irregular. Graphs. (M26)

28-M. (Russian.) **X-Ray Microphotography and X-Ray Microscopy.** D. B. Gogoberidze. *Uspekhi Fizicheskikh Nauk,* v. 50, no. 4, Aug. 1953, p. 577-599.

A medium with a smaller wavelength was developed to increase the resolving power of microscopes. Micrographs, diagrams. 43 ref. (M21)

29-M. The Preparation and Properties of Molybdenum-Germanium Compounds. Alan W. Searcy and Robert J. Peavler. *American Chemical Society, Journal,* v. 75, Nov. 20, 1953, p. 5657-5659.

X-ray diffraction investigation established existence of Mo_3Ge_2, Mo_2Ge_3, alpha-$MoGe_2$ and beta-$MoGe_2$ in addition to Mo_3Ge which has already been reported. Tables. 8 ref. (M22, P general, Ge, Mo)

30-M. A Survey of the Uranium-Nickel System. J. D. Grogan and R. J. Pleasance. **Appendix on an X-Ray Examination of Some Uranium-Nickel Alloys.** Betty E. Williams. *Institute of Metals, Journal,* v. 82, Nov. 1953, p. 141-147.

Liquidus curve plotted and phase compositions determined. Phase diagram, tables, micrographs. (M24, Ni, U)

31-M. McQuaid-Ehn Grain Size Determined by Spectrochemical Analysis. G. E. Ressler. *Journal of Metals,* v. 5, Dec. 1953, p. 1622.

Correlates aluminum determinations with grain size in carburizing and medium carbon grades of killed steel. Table. (M27, S11, CN)

32-M. Surface Structures on Single Crystals Produced From Melt. F. D. Rosi. *Journal of Metals,* v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1661-1662.

Transverse cellular structure and longitudinal striae on crystals produced by the Bridgeman method. Micrographs. 8 ref. (M26, M28, Cu)

33-M. Hyperfine Structure of Silver and Gold by the Atomic Beam Magnetic Resonance Method. Günter Wessel and Hin Lew. *Physical Review,* v. 92, ser. 2, Nov. 1, 1953, p. 641-646.

Hyperfine structures of ground states studied by means of an ionizer of electron bombardment-type applied to a beam of atoms in a magnetic resonance apparatus. Diagrams, graphs, tables. 17 ref. (M23, M25, Ag, Au)

34-M. The Zeeman Effect of the Cr Ground State. P. Brix, J. T. Eisinger, H. Lew and G. Wessel. *Physical Review,* v. 92, ser. 2, Nov. 1, 1953, p. 647-650.

Studies using the atomic beam magnetic resonance method at magnetic fields up to 850 gauss. Chromium atoms detected by means of an electron-bombardment type ionizer. Tables, graphs. 14 ref. (M23, M25, Cr)

35-M. (French.) **Observation of Polygonization in Uranium by X-Ray Diffraction.** Adrienne R. Weill and Pierre A. Jacquet. *Comptes rendus,* v. 237, no. 17, Oct. 28, 1953, p. 1002-1003.

Method permits study of grain

substructure and simultaneous comparison of microscopic and radiocrystallographic examinations. Micrographs. 5 ref.
(M22, M21, M23, U)

36-M. (German.) **The Iron-Iron Silicide-Copper Silicide-Copper Constitution Diagram.** Rudolf Vogel and Dietrich Horstmann. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct., 1953, p. 435-440.

Thermal and metallographic study of iron-silicon-copper system and determination of lower and upper critical temperature of ternary miscibility gap. Tables, graphs, micrographs. (M24, Cu, Si, Fe)

37-M. (German.) **The Chromium-Silicon System, and Some Silicide Solid Solutions.** Richard Kieffer, Friedrich Benesovsky and Hermann Schroth. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 437-442.

Production of specimens by hot pressing and melting. Scaling behavior and physical properties. Preliminary phase diagram plotted on basis of melting point and structural and radiographic investigations. Investigations are reported on $CrSi_2$-$TiSi_2$, $CrSi_2$-$TaSi_2$, and Cr_3Si-Mo_3Si. Tables, micrographs. 31 ref.
(M24, Cr, Si, Mo)

38-M. (German.) **Crystal Chemistry of B-Metals. II. Discussion and Investigation of Trigonally Distorted NaCl Structures.** Konrad Schubert and Horst Fricke. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 457-461.

Occurrence of trigonally distorted NaCl (B1) systems. Effect of third components upon axial relations of SnSb. Crystal structure of GeTe and Bi_2Se_3. Graphs, micrographs, table. 12 ref.
(M26, Nb, Sb, Ge, Te, Bi, Se)

39-M. (German.) **The Dependence of the Solidification Curve Upon Orientation in Cubic, Face-Centered Metal Crystals.** P. Haasen. *Zeitschrift für Physik,* v. 136, no. 1, 1953, p. 26-39.

Theoretical interpretation of previous experimental findings on basis of a specific mutual effect of a displacement in main glide system and displacement in the various disturbance systems. Tables, graphs. 33 ref. (M26, N12)

40-M. (Russian.) **Problem of the Structure of Oxide Forming on Aluminum Surface.** M. S. Beletskii. *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 89-91.

Interatomic distances of gamma oxide crystals determined by X-ray structural analysis. Graph. 4 ref. (M26, R2, Al)

41-M. (Russian.) **Changes on Metal Surfaces Caused by Chemical Processes and Heating.** S. Z. Roginskii, I. I. Tretiakov and A. B. Shekhter. *Doklady Akademii Nauk SSSR,* v. 91, no. 5, Aug. 11, 1953, p. 1167-1169 + 1 plate.

Electron microscopic investigations of surface changes under various conditions detected new characteristics. Micrographs. 7 ref. (M21)

42-M. **The Electron Microscope and Its Application to Metallurgy.** V. A. Pickles. *Australasian Engineer,* 1953, Oct., p. 61-69.

Includes photographs, diagrams. tables. 45 ref. (M21)

43-M. **Heat Treating Temperatures in Relation to the Iron-Carbon Diagram.** *Materials & Methods,* v. 38, Dec. 1953, p. 147.

Phase diagram from paper by Edward J. Ocean at the A.G.A. Industrial Gas School, May 1953. (M24)

44-M. **Automatic Grain Counter for Assessing Quantitatively High-Resolution Autoradiographs.** R. A. Dudley and S. R. Pelc. *Nature,* v. 172, Nov. 28, 1953, p. 992-993.

Construction and operation. Graph. 2 ref. (M23)

45-M. (French.) **The Use of Radio-Elements to Study Segregation of Impurities in High-Purity Aluminum Grain Boundaries.** F. Montariol, Ph. Albert and G. Chaudron. *Revue de métallurgie,* v. 50, no. 11, Nov. 1953, p. 768-774.

Results show that method is valuable when impurities consist of zinc or ruthenium. Micrographs, table. 4 ref. (M23, Al, Zn, Ru)

46-M. (Russian.) **Structure and Properties of Chromium Nitride and Ferrochromium.** M. L. Korolev. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 10, Oct., p. 1465-1470.

Chromium-nitrogen alloys were prepared and tested. Hardness of structural components was measured at temperatures up to 1000° C. Tables, graphs, diagram. 8 ref. (M27, Q general)

47-M. (French.) **Electron Diffraction Studies of the Formation of Single Crystals of Aluminum-Copper Alloys by Heating in Vacuum.** Noboru Takahashi and Jean-Jacques Trillat. *Comptes rendus,* v. 237, no. 19, Nov. 16, 1953, p. 1246-1248.

Appearance and transformation of certain phases of aluminum-copper alloys to the monocrystalline state. Includes Debye-Scherrer diagrams. (M22, Al, Cu)

48-M. Lattice Dynamics of Body-Centered and Face-Centered Cubic Metallic Elements. Jules de Launay. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 1975-1986.

Includes diagrams. 16 ref. (M26)

49-M. Some Alloy Systems of Titanium. Maurice Cook. *Light Metals,* v. 16, Dec. 1953, p. 400-401.

Properties, phase transformations and microstructure of various alloys. Micrographs, graphs. (M24, M27, N6, Q general, Ti)

50-M. Typical Microstructures of Commercial Titanium Alloys. Roman Osadchuk, William P. Koster, and John F. Kahles. *Metal Progress,* v. 64, Nov. 1953, p. 96B.

Data sheet. (M27, Ti)

51-M. The Nonhomogeneity of Austenite. I. A. Oding and M. G. Lozinsky. *National Science Foundation Translation,* no. 52, Aug. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 275-278.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Studies of factors that apparently affect formation of nonhomogeneous structure of austenite grains in steel. Diagram, graph, micrographs. 8 ref. (M27, N8, AY)

52-M. Scattering of X-Rays by Metals at Very Small Angles. B. M. Rovinsky and V. M. Genkin. *National Science Founation Translation,* no. 84, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, no. 4, Apr. 1953, p. 673-675.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 434-M, 1953. (M22)

53-M. An X-Ray Examination of an Alpha (Al-Fe-Si) Ternary Compound. Keith Robinson and P. J. Black. *Philosophical Magazine,* v. 44, 7th ser., no. 359, Dec. 1953, p. 1392-1397.

Results of experimental studies. Diagrams. 10 ref. (M26, M22)

54-M. (Book.) **Data for X-Ray Analysis. v. I. Charts for Solution of Bragg's Equation (*d* Versus *Theta* and Two *Theta*).** W. Parrish, M. G. Ekstein and B. W. Irwin, 81 p. **v. II. Tables for Computing the Lattice Constant for Cubic Crystals.** W. Parrish, M. G. Ekstein and B. W. Irwin. 99 p. 1953. N. V. Phillips' Gloeilampenfabrieken, Eindhoven, Netherlands; Cleaver-Hume Press. Ltd., 42a South Audley Street, W.1, London. 15s. each.

The first volume contains 85 charts of interplanar spacing *d* versus Bragg angle *theta* for the *Ka* radiations of five target materials, namely molybdenum, copper, cobalt, iron and chromium. Valuable for users of X-ray spectrometers. In the second volume, data necessary for the accurate determination of lattice parameters of cubic crystals are presented as a series of tables. (M26, S11)

55-M. A Relationship of Microstructure to the Mechanical Properties of White Irons. W. J. Williams. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Dec. 1953, p. 132-134 + 6 plates.

Results of experimental studies. Photographs. 2 ref. (M27, Q general)

56-M. An Electron-Diffraction Investigation of the Structure of Electrodeposited Coatings on Iron Single Crystals. D. J. Evans and M. R. Hopkins. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 229-238; disc., p. 245-251.

Results emphasize importance of effect of composition of plating solution upon the structure of the deposit, since with some solutions, only a polycrystalline deposit has been observed under a variety of plating conditions. Diagrams, graphs, table. 5 ref. (M26, L17, M22, Zn, Cu, Fe, Ni)

57-M. The Crystal Structure of Electrodeposited Silver. D. N. Layton. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 239-244; disc., p. 245-251 + 1 plate.

Electron-diffraction examination showed this thin deposit to consist of small randomly disposed crystals. Diagrams, table. 17 ref. (M26, L17, M22, Ag)

58-M. The System Uranium-Lead. B. R. T. Frost and J. T. Maskrey. *Institute of Metals, Journal,* v. 82, Dec. 1953, p. 171-180.

System uranium-lead has been investigated over the whole composition range and up to 1250° C. by micrographic, X-ray and thermal analysis methods. Diagrams, tables, graphs. 13 ref. (M24, M21, M23, U, Pb)

59-M. New Methods Determine Grain Size Ultrasonically. Nicholas Grossman. *Iron Age,* v. 172, Dec. 31, 1953, p. 72-75.

Nondestructive test for grain size of metal in determining inherent physical character. Tables, oscillographs, graph. (M27, Cu)

60-M. The Iron-Carbon Diagram. R. Whitfield. *Machinery (London),* v. 83, Dec. 25, 1953, p. 1253-1255.

Carbon contents of 1.5 to 4.3%. Diagram, table. (M24, ST, CI)

61-M. The Electronic Structure of Some Body-Centred Cubic Metals. G. G. Hall. *Physical Society, Proceedings,* v. 66, no. 408A, Dec. 1953, p. 1162-1171.

Form of energy surfaces for both standard excited state and ground state deduced using transformation properties of a determinant wave function. Expressions thus found do not depend on any analytical approximation to wave functions nor on any arbitrary simplification of theory. Values for lithium and sodium found by fitting theoretical energies to energies calculated by other methods. Tables, diagram. 14 ref. (M25, Li, Na)

62-M. Is Proeutectoid Ferrite or Cementite Continuous With Pearlite Cementite? S. Modin. Henry Brutcher, Altadena, Cal., Translation no. 2810, 6 p. + 1 plate. (From *Jernkontorets Annaler,* v. 135, no. 4, 1951, p. 169-174.)

Previously abstracted from original. See item 299-M, 1951. (M26, ST)

63-M. Chemical Polishing of Iron and Soft Steel. L. Beaujard. Henry Brutcher, Altadena, Cal., Translation no. 3051, 3 p. + 1 plate. (From *Comptes rendus hebdom. des Séances de l'Académie des Sciences* (Paris) v. 234, 1952, p. 440-442.)

Previously abstracted from original. See item 121-M, 1952. (M21, Fe, ST)

64-M. On the Structure of Spheroidal Graphite Cast Iron. A. Wittmoser. Henry Brutcher, Altadena, Cal., Translation no. 3069, 27 p. + 3 plates. (Condensed from *Giesserei,* nos. 6-8, 1952, p. 323-334.)

Difference in structure between spheroidal and lamellar graphite cast irons. Etch test for revealing primary structure and identification of inclusions developed by etches and characterized by "walls". Micrographs, tables. 36 ref. (M27, M21, CI)

65-M. Development of Primary Structures of Welds in Low-Carbon and Low-Alloy Steels by Electrolytic Etching. A. A. Rossoshinskii. Henry Brutcher, Altadena, Cal., Translation no. 3071, 5 p. + 1 plate. (From *Avtomaticheskaya Svarka,* v. 6, no. 1, 1953, p. 52-54.)

Principle underlying development of primary structures by metallographic techniques. Shortcomings of deep etching and of multiple etching as applied to development of primary structure. Diagram, micrographs. 9 ref. (M21, K9, AY)

66-M. Mechanism of Etching of Metals by Ionic Bombardment. G. V. Spivak, I. N. Prilezhaeva, and O. I. Savochkina. Henry Brutcher, Altadena, Cal., Translation no. 3079, 8 p. + 1 plate. (From *Doklady Akademii Nauk SSSR,* v. 88, no. 3, 1953, p. 511-514.)

Studies of mechanism of cathodic atomization of metals in a gas discharge to develop their structure. Explanation of associated structural transformations on the basis of modern theory of formation of ionic and metallic crystals. Graph, micrographs. 15 ref. (M21, Al)

67-M. (German.) **The Tungsten Carbide-Titanium Carbide-Chromium Carbide System.** O. Rüdiger. *Metall,* v. 7, nos. 23-24, Dec. 1953, p. 967-969.

X-ray, metallographic and microhardness investigations. Table, graphs, micrographs. (M24, W, Ti, Cr)

68-M. (Hungarian.) **A New Method for Polishing and Etching of Metallographic Specimens of Tungsten and Molybdenum.** Tivadar Millner and Lorant Sass. *Aluminium (Budapest),* v. 5, no. 10, Oct. 1953, p. 214-215.

Solution prepared for grain boundary etching. Micrographs. 3 ref. (M21, W, Mo)

69-M. (Russian.) **Study of Ore Structures With Aid of Electron Microscope.** F. V. Syromiatnikov and A. F. Filimonov. *Izvestiia Akademii Nauk SSSR, Seriia Geologicheskaia,* 1953, no. 5, Sept.-Oct., p. 135-140.

Resolving power of 0.005 to 0.006 microns was sufficient for examination of clays, sooty ores, bauxites and manganese, iron and sulfide ores. Photographs, micrographs. 3 ref. (M21, M27, Fe, Mn)

70-M. Structure of Graphite Spherulites. M. N. Parthasarathi and B. R. Nijhawan. *Foundry Trade Journal,* v. 95, Dec. 31, 1953, p. 809-815.

Experimental data based on study of group of four nodules across its different parallel sections. Micrograph, table, photographs, diagrams. 7 ref. (M27, CI)

71-M. Structure of Some Iridium-Osmium Alloys. H. C. Vacher, C. J. Bechtoldt and E. Maxwell. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Jan. 1954, p. 80.

Techniques of crushing, polishing, and etching prior to X-ray diffraction and microscopic examination. Table, micrograph. 3 ref. (M21, M27, Ir, Os)

72-M. The Gallium-Indium System. W. J. Svirbely and Sidney M. Selis.

Journal of Physical Chemistry, v. 58, Jan. 1954, p. 33-35.

Specific resistance of solid and liquid gallium and indium and their alloys have been determined. From results of these resistance measurements, phase diagram for gallium-indium system has been redetermined. Graphs. 10 ref. (M24, P15, Ga, In)

73-M. Simplified Autoradiography Exposure Calculation. William W. Wainwright, Ernest C. Anderson, Preston C. Hammer and Charles A. Lehman. *Nucleonics,* v. 12, Jan. 1954, p. 19-21.

Detail is improved by use of weak beta emitters. In isotope selection, charts are used to compare half-lives, emission energies, and to calculate exposure time. Photograph, autoradiographs, graph. 7 ref. (M23)

74-M. Analytical Aspects of X-Ray Diffraction. James I. Mueller. *Trend in Engineering, (University of Washington),* v. 6, Jan. 1954, p. 5-9, 28.

Applications in the fields of metallurgy; mining and prospecting; mineral preparation; and ceramics. Spectrographs, graphs, table, diagram. (M22)

75-M. (English.) **Ternary Alloys Formed by Aluminium, Transitional Metals and Divalent Metals.** G. V. Raynor, C. R. Faulkner, J. D. Noden and A. R. Harding. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 629-648.

Main features of equilibria in terms of free energies of phases present, and data, taken together with results of previous work. Graphs, diagrams, tables. 32 ref. (M24, Al)

76-M. (English.) **Local Atomic Arrangements in Gold-Nickel Alloys.** P. A. Flinn, B. L. Averbach and Morris Cohen. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 665-673.

These alloys exhibit a preference for *unlike* neighbors above the solubility temperature and have short-range order analogous to that in copper-gold alloys. Diagrams, graphs, tables. 14 ref. (M25, N10, Au, Ni)

77-M. (English.) **The Structure of Gamma-Manganese.** Z. S. Basinski and J. W. Christian. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 754-755.

Disputes that gamma-manganese has face-centered-tetragonal structure at all temperatures. 4 ref. (M26, Mn)

78-M. (French.) **The Measuring of Lattice Distortions in Metal Single Crystals.** H. Lambot, L. Vassamillet and J. Dejace. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 711-719.

Use of a converging X-ray beam obtained by means of a curved quartz monochromator enables one to determine angular distortions of a crystal lattice. Single crystal to be studied is irradiated along one or two narrow bands, approximately 50 microns in width. Diagrams. 11 ref. (M26)

79-M. (French.) **X-Ray Investigation of the Development of a Polygonized State From a Slightly Deformed Copper-Zinc Solid Solution.** Adrienne R. Weill. *Comptes rendus,* v. 237, no. 23, Dec. 9, 1953, p. 1527-1529.

Study of X-ray diffraction diagrams of 35% zinc alloy confirms the polygonization mechanism. Micrographs. 2 ref. (M22, N12, Cu, Zn)

80-M. (French.) **An Example of the Transference of Metallographic Laws and Phenomena: From Light Aluminum Alloys to Heat-Resistant Austenitic Alloys.** Albert Portevin. *Revue de Métallurgie,* v. 50, no. 12, Dec. 1953, p. 809-816.

Importance of applying knowledge gained in one field to problems of another. Application of phenomena, laws and results determined in study of light alloys to austenitic alloys. 17 ref. (M general, Al, SS)

81-M. (French.) **Contribution to the Study of Diagrams Given by the Chevenard Micro-Tensile Testing Machine.** H. Hendus, H. Röhrig and G. Kraus. *Revue de Métallurgie,* v. 50, no. 12, Dec. 1953, p. 844-846.

Formulas were derived for determining time elapsing between any two points of the diagram, rates of loading, elongation, and modulus of elasticity. Diagram, graphs. 2 ref. (M23, M24, Q27)

82-M. The Structure of Titanium-Silver Alloys in the Range 0-30 At.-% Silver. H. W. Worner. *Institute of Metals, Journal,* v. 82, Jan. 1954, p. 222-226 + 1 plate.

Metallographic and X-ray diffraction methods have been used to determine a partial phase diagram between 0 and 30 at. % silver, in temperature range 650-1100° C. Graphs, tables. 7 ref. (M24, Ti, Ag)

83-M. The Constitution of Alloys of Aluminium, Copper, and Iron. H. W. L. Phillips. *Institute of Metals, Journal,* v. 82, Jan. 1954, p. 197-212 + 2 plates.

Constitution of aluminum-rich alloys has been investigated over the range 0-40% copper, 0-3.5% iron by thermal analysis and microscopic examination, supplemented by measurements of liquid solubility. Graphs, tables. 21 ref. (M24, M23, M21, Al, Cu, Fe)

84-M. The Metallographic Detection of Gamma Phase in Beta-Brass. L. E. Samuels. *Institute of Metals, Journal,* v. 82, Jan. 1954, p. 227-228 + 1 plate.

Mechanical polishing was used to detect fine grain-boundary precipitates of gamma phase in a tin-containing beta-brass showing intercrystalline brittleness. 11 ref. (M21, Cu)

85-M. Take Guesswork Out of Grain Size Determinations. Richard F. Harvey. *Steel,* v. 134, Feb. 1, 1954, p. 108-109.

New technique which makes high speed toolsteel grain boundaries as clear as original hardened structure before tempering. Graph, micrographs. 2 ref. (M27, TS)

86-M. On the Solid Solutions of Metallic Compounds. I. I. Kornilov. Henry Brutcher, Altadena, Cal., Translation no. 2842, 9 p. (From *Doklady Akademii Nauk SSSR,* v. 81, no. 4, 1951, p. 597-600.)

Previously abstracted from original. See item 138-M, 1952.
(M26, Fe, Cr, V, Al, Ti, Zr, Cb, Ta)

87-M. Structure of Iron-Nickel-Aluminum Alloys for Permanent Magnets. Yu. Skakov. Henry Brutcher, Altadena, Cal., Translation no. 3052, 9 p. (From *Doklady Akademii Nauk SSSR,* v. 79, no. 1, 1951, p. 77-80.)

Previously abstracted from the original. See item 49-M, 1952.
(M26, Ni, SG-n)

88-M. (French.) **Direct Examination of Metals by the Electron Microscope.** Raymond Castaing and Paul Laborie. *Comptes rendus,* v. 237, no. 21, Nov. 23, 1953, p. 1330-1332.

Metal specimens were thinned by ionic bombardment and examined. Advantages of method. Micrographs. (M21)

89-M. (Book.) **Dislocations in Crystals.** W. T. Read, Jr. 228 p. 1953. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $5.00.

Designed for use in industry and graduate school by those dealing with physical metallurgy and branches of solid-state physics.
(M26)

90-M. (Book.) **Procedures in Experimental Metallurgy.** A. U. Seybolt and J. E. Burke. 340 p. 1953. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $7.00.

Most of the important laboratory techniques which are now used in preparation of metals and alloy specimens for further study.
(M21, M22, M23)

91-M. Constitution of Iron-Boron Alloys in the Low Boron Range. M. E. Nicholson. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 185-190.

Results of studies in solubility of boron in iron. Graphs, micrographs, tables, diagram, 10 ref. (M24, Fe)

92-M. Crystallographic Angles for Hexagonal Metals. A. Taylor and Sam Leber. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 190-192.

Interplanar angles are used to construct a stereographic projection. Tables, diagram. 4 ref. (M26)

93-M. Influence of Oxygen, Nitrogen, and Carbon on the Phase Relationships of the Ti-Al System. R. J. Van Thyne and H. D. Kessler. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 193-199.

Phase diagrams. Micrographic analysis of annealed high-purity arc-melted alloys was principal method of investigation, supplemented by X-ray diffraction. Graphs, micrographs, tables. 7 ref.
(M24, M21, M22, Ti, Al)

94-M. Titanium-Chromium-Oxygen System. Chih-Chung Wang and Nicholas J. Grant. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 200-206.

Phase diagrams, diagrams, tables, micrographs, graphs. 17 ref.
(M24, Ti)

95-M. Uranium-Titanium Alloy System. Murray C. Udy and Francis W. Boulger. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 207-210.

Preparation of alloys, fabrication, heat treatment, metallographic and X-ray examination and phases present. Micrographs, table, phase diagram. 2 ref. (M24, U, Ti)

96-M. A Cursory Investigation of Intermediate Phases in the Systems Ti-Zn, Ti-Hg, Zr-Zn, Zr-Cd, and Zr-Hg by X-Ray Powder Diffraction Methods. Paul Pietrokowsky. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 219-226.

Physical metallurgy of titanium and zirconium when alloyed with elements in subgroup II-B of periodic table. Tables. 15 ref.
(M24, M22, Ti, Zn, Hg, Cd)

97-M. System Titanium-Manganese-Molybdenum. R. P. Elliott, B. W. Levinger and W. Rostoker. *Journal*

of Metals, v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 228-232.

Phase equilibria in Ti-Mn-Mo system investigated in composition range 100 to 60% titanium and in temperature range 500° to 1150° C. Phase diagrams, table. 7 ref.
(M24, Ti, Mn, Mo)

98-M. Constitution and Properties of Ag-Cu-Zn Brazing Alloys. Karl M. Weigert. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 233-237.

Results of experimental studies on structure and mechanical properties. Micrograph, phase diagrams, graphs, table. 6 ref.
(M24, Q general, Ag, Cu, Zn)

99-M. System Zirconium-Oxygen. R. F. Domagala and D. J. McPherson. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 238-246.

Results of experimental studies. Tables, diagram, micrograph. 18 ref. (M24, Zr)

100-M. The Sigma Phase in Binary Alloys. Peter Greenfield and Paul A. Beck. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 253-257.

Experimental data on conditions for sigma formation in a series of alloys. Tables. 28 ref.
(M26, M24, V, Ni, Co, Mn, Cr, Fe, Mo, Nb, Ta, W)

101-M. An Investigation of the Systems Formed by Chromium, Molybdenum, and Nickel. David S. Bloom and Nicholas J. Grant. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 261-268.

Investigation of Cr-Mo-Ni ternary system and attendant binaries has been completed. Graphs, phase diagrams, table, micrograph. 7 ref.
(M24, Co, Mo, Ni)

102-M. Highly Sensitive Dilatometer. *Metal Progress,* v. 65, Feb. 1954, p. 202, 204, 206, 208. (Digest of "Improved Precision Equipment for Metallurgical Analysis. I. Differential Transformer Dilatometer", L. L. Wyman, U. S. Atomic Energy Commission Report KAPL-654, available from Office of Technical Services, Dept. of Commerce, Washington 25, D. C. Price 20 cents.)

Experimental work in instrumentation. (M23)

103-M. Specialized Microscopical Techniques in Metallurgy. S. Tolansky. Paper from "Properties of Metallic Surfaces". Monograph and Report Series 13. Institute of Metals, London. p. 1-22; disc., p. 295-364.

General survey of the microscope as used for metallurgical studies. Micrographs. 10 ref. (M21)

104-M. (English.) **Microscopic Studies on Deformed ZnS-Crystals.** E. Votava, S. Amelinckx and W. Dekeyser. *Physica,* v. 19, no. 12, Dec. 1953, p. 1163-1172.

An optical and interferometric study was made of (111) faces of zinc sulfide crystals grown at relatively high temperature. Micrographs, diagrams. 9 ref. (M26)

105-M. (English.) **Interferometric Measurement of Grain Boundary Grooves.** S. Amelinckx, N. F. Binnendijk and W. Dekeyser. *Physica,* v. 19, no. 12, Dec. 1953, p. 1173-1177.

Use of multiple beam interferometry for measurements of the dihedral angle of the groove between grains of a polycrystalline metal aggregate. Micrographs, diagrams. 3 ref. (M27)

106-M. (Czech.) **Analyzing Nonmetallic Inclusions in Steel by Electrolysis and Chlorination Electrolytical Analysis of Steel Carbides.** Miroslav Sicha. *Hutnické Listy,* v. 9, no. 1, Jan. 1954, p. 2-11 + 2 plates.

Inclusions were separated from carbides by chlorinating them in a vacuum vessel. Sulfides were disengaged by electrolytical remainders and detected by special device. Diagrams, photographs, micrographs, table. 13 ref. (M23, S11, ST)

107-M. (German.) **The Analysis of Structural Components in Pig and Cast Iron.** Walter Koch and Joachim Bruck. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 457-464; disc., p. 464.

Microscopic, X-ray and electrochemical studies. Technique. Tables, graphs, micrographs. 23 ref. (M21, CI)

108-M. (German.) **Metallographic Investigations of Nonmetallic Inclusions in Steel by a Novel Thin-Specimen Process.** Erich Folkhard. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 519-522.

Specimens were ground fine and the metal matrix dissolved and examined under the microscope. Micrographs. 3 ref. (M21, ST)

109-M. (German.) **History and Status of Constitution Research. I.** H. Spengler. *Metall,* v. 8, nos. 1-2, Jan. 1954, p. 24-25.

Research work on constitution of alloys to 1950. Tables, graphs. 4 ref. (M24)

110-M. (Italian.) **The Hume-Rothery Phases in Alloys With More Than Two Components. I. Composition of Hume-Rothery Phases in Alloys With More Than Two Components. II. Phases With a 7:4 Ratio in the Ni-Cu-Sn System. III. Phases With Ratios of 3:2 and 21:13 in the Ni-Cu-Sn System.** Francesco Mazzoleni. *Metallurgia italiana,* v. 45, no. 10, Oct. 1953, p. 363-373.

X-ray diffraction studies on alloys with various valence electron ratios. Diffraction spectra, diagrams. 21 ref. (M22, M24, Cu, Ni, Sn)

111-M. (Swedish.) **Grain-Size Charts for Ferritic and Austenitic Structures.** T. Berglund. *Jernkontorets Annaler,* v. 137, no. 11, 1953, p. 767-784.

New charts representing actual structures of ferrite, low-carbon steel and austenite. Relation between JKM and ASTM classifications for steels and copper alloys. Tables, graphs, micrographs. 6 ref. (M27, AY, Cu)

112-M. Direct Observations of Dislocations in Crystals. A. J. Forty. *Advances in Physics,* v. 3, Jan. 1954, p. 1-25 + 24 plates.

Detection, arrays of dislocations, evidence for movement and state of dislocation. Diagrams, micrographs. 69 ref. (M26)

113-M. Electron Diffraction Study of the Structures of Antimony Electrodeposited on Antimony Cleavage Face. Ling Yang. *Journal of Applied Physics,* v. 25, Feb. 1954, p. 184-188.

Various factors controlling crystal orientation in electrodeposited metals. Micrographs, diagrams, tables. 3 ref. (M26, Sb)

114-M. The Wustite Phase in Partially Reduced Hematite. Gust Bitsianes and T. L. Joseph. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 150-153.

Study of the wüstite phase that had formed during partial reduction of a cylindrical compact of chemically pure hematite. Photograph, micrographs, graphs, table, spectrogram. 3 ref. (M27, Fe)

115-M. An Improved Method for Routine Electrolytic Polishing of Microspecimens. R. L. Hancher. *Metallurgia,* v. 49, no. 291, Jan. 1954, p. 47-51.

Experiments show that optimum polishing conditions, for a particular specimen, are dependent on voltage-resistance characteristics of cell. Diagrams, graph, photographs, micrographs. 5 ref. (M21)

116-M. (English.) **Transition Metal Diborides.** Benjamin Post, Frank W. Glaser and David Moskowitz. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 20-25.

Structural characteristics of eight transition metal diborides. Extent of solid solubility appeared to depend mainly on size factors. Tables, diagrams. 14 ref.
(M26, Cr, V, Ti, Mo, Ta, Nb, Hf, Zr)

117-M. (English.) **Interstitial and Vacancy Migration in Cu_3Au and Copper.** J. A. Brinkman, C. E. Dixon and C. J. Meechan. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 38-48.

Vacant lattice sites and interstitial atoms in excess of equilibrium concentrations have been introduced into alloy Cu_3Au by quenching rapidly from high temperatures and by irradiating with cyclotron particles. Graphs, tables. 21 ref.
(M25, Cu, Au)

118-M. (French.) **Orientation of Fine Substructure on Crystal Faces of Aluminum and Its Alloys as Observed in the Electron Microscope.** Pierre Bussy. *Comptes rendus,* v. 238, no. 2, Jan. 11, 1954, p. 247-249.

Attempts to establish nature of variation of orientation from one crystal to another. Micrographs. 3 ref. (M26, Al)

119-M. (French.) **Selective Oxidation of a Monocrystal of Alpha Brass.** Noboru Takahashi. *Comptes rendus,* v. 238, no. 4, Jan. 25, 1954, p. 462-463.

Oxidation of Cu_2O and ZnO studied by electron diffraction. Multiple reflection effect was noted in case of ZnO. Micrographs. 1 ref.
(M22, R2, Cu)

120-M. (French.) **Heterogeneity of Copper Crystals Produced by Electrolytic Deposit on a Monocrystal of Electrolytically Polished Beta-Brass.** Noboru Takahashi. *Journal de chimie physique,* v. 50, nos. 11-12, Nov.-Dec. 1953, p. 624-628 + 1 plate.

Copper precipitated on plane (211) of beta-brass takes on hexagonal and face-centered cubic forms in the submicroscopic twinned state. Orientations between these crystals are explained. Phenomena studied by electron diffraction. Micrographs, table, diagrams.
(M26, N7, Cu)

121-M. (French.) **Properties of Iron Binary Alloys.** T. G. Owe Berg. *Journal de physique et le radium,* v. 15, no. 2, Feb. 1954, p. 99-100.

Systems formed by combining

iron with elements of higher atomic numbers contain two phases characterized by different electron densities. 3 ref. (M24, Fe)

122-M. (Russian.) **Possible Development of the Dislocation Theory.** V. I. Arkharov, G. N. Kolesnikov and A. N. Orlov. *Doklady Akademii Nauk SSSR,* v. 92, no. 4, Oct. 1, 1953, p. 751-754.

Possibility of correcting the basic difficulty of modern dislocation theory. 2 ref. (M26)

123-M. (Swedish.) **Sigma Phase in Stainless Steel.** Stig-Erik Erikson. *Svetsaren,* v. 18, no. 3, 1953, p. 33-35.

Iron-chromium and iron-chromium-nickel constitution diagrams, hardness-temperature graphs, and strength properties of welded stainless steel. Tables, graphs, micrographs. 9 ref.
(M24, Q general, SS)

124-M. **Micrographic Analysis of Ferro-Alloys and Alloy Steels by Heat Tinting.** S. S. Gorelik and B. G. Livshits. *Henry Brutcher, Altadena, Calif., Translation no.* 3193, 6 p. (From *Zavodskaya Laboratoriya,* v. 16, no. 5, 1950, p. 578-580.)

Relationship between dissociation pressure of oxide and thickness of oxide film formed by atmospheric oxygen at increased temperatures. Micrographs. 6 ref. (M23, AY, Fe)

125-M. (French.) **Physicochemical Investigation of Carbide Phases Derived From Cobalt and Certain Special Cementites.** Jean Drain. *Annales de chimie (Paris),* v. 8, Nov.-Dec. 1953, p. 900-953.

Studies on preparation, properties and structure of carbides and carbide phases in cobalt; influence of cobalt on properties of cementite; and influence of sulfur on orthorhombic carbides. Tables, graphs. 40 ref. (M26, Co, Fe)

126-M. (French.) **Ultra Rapid Micrographic Examination of Copper and Its Alloys.** P. A. Jacquet. *Cuivre-Laitons-Alliages,* no. 16, Nov.-Dec. 1953, p. 43-55.

Automatic polishing apparatus which permits metallographic quality control in production shops.
(M21, Cu)

127-M. (French.) **Application of Color Micrography to Study of Aluminum, Iron, and Copper by Means of Formation of Thin Films With Interference Shades.** P. Lacombe and M. Mouflard. *Métaux, Corrosion-Industries,* v. 28, no. 340, Dec. 1953, p. 471-488 + 5 plates.

Method which gives greater sensitivity to microscopic examination. Micrographs. 60 ref.
(M21, Al, Cu, Fe)

128-M. (Book.) **Structure and Properties of Solid Surfaces.** Robert Gomer and Cyril Stanley Smith, editors. 491 p. 1953. University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill. $8.50.

Fourteen papers presented at a conference arranged by the National Research Council in September 1952. Contents may be divided into four main groups: thermodynamics and theories of surface forces; the structure of a surface and means of determining it; growth processes of and on surfaces; and processes on surfaces which leave them relatively unaltered.
(M general, N general, P general)

129-M. (Book—French.) **(Heterogeneity of Steel Ingots). Etude de l'Hétérogénéité des l'Ingots de Forge.** P. Chattier, Ch. Dubois, J. Bleton and P. Bastien. 260 p. 1953. l'Institut de Recherches de la Sidérurgie, 185, Rue President-Roosevelt, Saint-Germain-en-Laye (S. & O.), Paris, France.

A comprehensive comparison of segregation and inclusion distribution in forged 300-mm. rounds of nickel-chromium steel from four different electric furnace practices. How inclusion distribution and heterogeneity may be related to mechanical properties of quenched and tempered material.
(M29, Q general, AY)

130-M. **The Mechanism of Metallographic Etching. I. The Reaction Potentials of a Two-Phase Brass in Various Etching Reagents.** George L. Kehl and Max Metlay. *Electrochemical Society, Journal,* v. 101, Mar. 1954, p. 124-127.

Potentials generated by reaction of portions of small, single grains of each of the two phases of alpha-beta brass with various etching solutions were measured. Potential of beta phase is consistently 0.01 to 0.03 v. more anodic than that of the alpha phase in the same reagent. Micrographs, graph, table. 6 ref.
(M21, Cu)

131-M. **Lattice Dynamics of Body-Centered and Face-Centered Cubic Metallic Elements.** Jules de Launay. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 1975-1986.

Lattice dynamics are modified to include the role which conduction electrons play in acoustical wave motion. This leads to relations connecting dynamic parameters with elastic constants and yields the Fuchs relations in an elementary manner. 18 ref. (M26)

132-M. **Phases in Titanium Alloys Identified by Cumulative Etching.** Elmars Ence and Harold Margolin.

Journal of Metals, v. 6, Mar. 1954, p. 346-348.

Techniques and advantages of process for use in phase diagram work. Diagram, micrograms, tables. 5 ref. (M21, M24, Ti, Mn, Fe)

133-M. Occurrence of Silicon Carbide in the Fe-C-Si System. James C. Fulton and John Chipman. *Journal of Metals,* v. 6, Mar. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Mar. 1954, p. 356-357.

Data on phase relations. Table, micrographs. 2 ref. (M24, Fe)

134-M. Constitution and Mechanical Properties of Titanium-Hydrogen Alloys. G. A. Lenning, C. M. Craighead and R. I. Jaffee. *Journal of Metals,* v. 6, Mar. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Mar. 1954, p. 367-376.

Hydrogen has little effect on tensile properties but decreases notch-bar toughness to a large degree. This latter effect appears to be result of increased notch sensitivity. Tables, micrographs, graphs. 11 ref. (M24, Q23, Ti)

135-M. Dislocations in Plastically Deformed Germanium. G. L. Pearson, W. T. Read, Jr., and F. J. Morin. *Physical Review,* v. 93, ser. 2, Feb. 15, 1954, p. 666-667.

Both *n*- and *p*-type germanium rods were deformed by bending. Hall effect, conductivity and lifetime were measured on both control and deformed samples. Graphs, micrograph. 5 ref. (M26, P15, Ge)

136-M. (Czech.) Metallography of Tin, Tin Alloys, and Tin Coating on Steel. Josef Teindl. *Hutnické Listy,* v. 9, no. 2, Feb. 1954, p. 95-98.

New ways of cleaning, coating, polishing and etching. Different methods for metallographic research of tin layers on steel. Micrographs, diagrams. 14 ref.
(M21, M27, L general, Sn, ST)

137-M. (French.) The Sigma Phase in Stainless Steels and Refractories and Its Practical Interest. Gilles Pomey. *Métallurgie et la construction mécanique,* v. 86, no. 2, Feb. 1954, p. 99-101, 103, 105-106.

General properties of the sigma phase. Outlines numerous investigations on its formation and influence on properties of steels. Diagrams, graphs, micrographs. 19 ref.
(M26, SS)

138-M. (German.) Metallographic Photomicrography on Small Negatives. K. Diebold. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 3-4, 1953, p. 341-357.

Reviews apparatus, materials, and methods. Small film projectors that can be used as illuminating equipment. Methods of increasing illuminating power of enlarging apparatus. Photographs, micrographs. (M21)

139-M. (German.) Quick Polishing of Metallographic Microsections From Cast Iron. Erling Juul Nielsen. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 89-92.

Sections with nonmetallic inclusions are polished first electrolytically and then mechanically. Micrographs, diagram. 14 ref. (M21, CI)

140-M. (German.) History and State of Composition Research. H. Spengler. *Metall,* v. 8, nos. 3-4, Feb. 1954, p. 107-115.

Survey of binary systems of metals and metalloids. Extensive bibliography in alphabetical order of metals and alloys involved. Tables. 4 ref. (M24)

141-M. (German.) Metallographic Means of Observing and Determining the Orientation of Crystals. Margarete Schippers. *Umschau in Wissenschaft und Technik,* v. 54, no. 4, Feb. 15, 1954, p. 111-114.

Recently developed methods for aluminum and its alloys. Micrographs. 7 ref. (M26, Al)

142-M. (German.) The Electron-Microscopic Investigation of Metal Surfaces With the Aid of Vapor-Deposited Silicon Monoxide Replicas. Heinz Wilsdorf. *Zeitschrift für Metallkunde,* v. 45, no. 1, Jan. 1954, p. 14-22.

Preparation of replicas, practical applications with resolutions up to 36 A, and first successful electron microscopic recording of an oxide-free metal surface by replica process. Photographs, micrographs, graphs. 40 ref. (M21, Ag, Cu)

143-M. (German.) The Alloys of Platinum Metals With Molybdenum. Ernst Raub. *Zeitschrift für Metallkunde,* v. 45, no. 1, Jan. 1954, p. 23-30.

Results of X-ray and metallographic investigations and hardness measurements of alloys of molybdenum with rhodium, ruthenium, palladium, osmium, indium and platinum. Tables, graphs, photomicrographs. 2 ref. (M24, Q29, Mo, Rh, Ru, Pd, Os, In, Pt)

144-M. (German.) Reactions of Several Magnesium Alloys With Cast-Iron Melts. Ulrich Zwicker. *Zeitschrift für Metallkunde,* v. 45, no. 1, Jan. 1954, p. 31-35.

Studies of effect of key-alloy components on metallographic structure of cast iron. Micrographs, graph. (M27, Mg, Si, CI)

145-M. (German.) **Electron Microscopic Dark Field Image as a Means of Identifying Small Crystals.** Otto Rang and Fritz Schleich. *Zeitschrift für Physik,* v. 136, no. 5, 1954, p. 547-555.

Investigates structure of individual crystals in a solid solution and possibility of determining their chemical composition. Examples. Diagrams, micrographs. 10 ref. (M26, M21)

146-M. (Hungarian.) **Metallographic Microphotography on Narrow Film. II.** Karoly Diebold. *Ontöde,* v. 5, no. 2, Feb. 1954, p. 33-40.

Practical suggestions for economical and successful processes, methods and equipment. Special equipment constructed by author. Photographs, micrographs. (M21)

147-M. Recent Developments in Electron Microscopy. Joseph J. Comer. *Mineral Industries,* v. 23, no. 6, Mar. 1954, p. 1, 3-5, 8.

Includes micrographs. 9 ref. (M21)

148-M. Changes in the Lattice Parameter of Polycrystalline Solid Solutions and Intercrystalline Internal Adsorption. V. I. Arkharov and N. N. Skornyakov. *National Science Foundation Translation, no.* 96, Oct. 1953, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 841-844.)

Introducing antimony into a copper-base alloy markedly increased lattice parameter of copper, beryllium decreased it, iron caused no perceptible change. Table. 7 ref. (M26, Cu, Sb)

149-M. On the Possible Development of the Theory of Dislocations. V. I. Arkharov, G. N. Kolesnikov and A. N. Orlov. *National Science Foundation Translation, no.* 212, Feb. 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 92, no. 4, Oct. 1, 1953, p. 751-754.)

Previously abstracted from original. See item 122-M, 1954. (M26)

150-M. Cohesion of the Alkali Metals in the Thomas-Fermi-Dirac Theory. N. H. March. *Philosophical Magazine,* v. 45, 7th ser., no. 362, Mar. 1954, p. 325-328.

Thomas-Fermi-Dirac method affords some explanation of metallic binding. Results predicted by theory. 10 ref. (M25, EG-e)

151-M. The Anomalous Spin of ^{47}Ti. B. H. Flowers. *Philosophical Magazine,* v. 45, 7th ser., no. 362, Mar. 1954, p. 329-332.

Spin is understood on basis of independent particle model provided proper account is taken of charge independence of nuclear forces. 13 ref. (M25, Ti)

152-M. Relation of Microstructure to High-Temperature Properties of a Wrought Cobalt-Base Alloy, Stellite 21 (AMS 5385). F. J. Clauss and J. W. Weeton. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3108, Mar. 1954, 49 p.

Microstructure of wrought Stellite 21 responds readily to solution treatment and to isothermal and aging heat treatments to form pearlitic and Widmanstätten structures as well as scattered precipitate. Graphs, micrographs, diagram, table. 7 ref. (M27, Q general, Co)

153-M. An Investigation of Lamellar Structures and Minor Phases in Eleven Cobalt-Base Alloys Before and After Heat Treatment. J. W. Weeton and R. A. Signorelli. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3109, Mar. 1954, 50 p.

Metallographic and X-ray diffraction studies. Tables, graphs, micrographs. 16 ref. (M26, M27, Co, Cr, Ni, Mo, W, Cb, Fe)

154-M. Principal Types of Phase Diagrams for Titanium-Base Binary Systems. I. I. Kornilov. *Henry Brutcher, Altadena, Calif., Translation no.* 3201, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 91, no. 3, July 21, 1953, p. 549-551.)

Previously abstracted from original. See item 26-M, 1954. (M24, Ti)

155-M. Optical Microscopy. George L. Kehl. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 1-32.

Phase contrast microscopy and reflecting-type objective. Micrographs, diagrams. 35 ref. (M21)

156-M. Field Emission Microscopy. Erwin W. Müller. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 33-50.

Instrument produces magnifications of 500,000 times. Due to unique current density of field emission, pictures are bright enough to be photographed with motion picture camera at ordinary frame speed or to be projected on a large screen in an auditorium. Diagrams, micrographs. 9 ref. (M21)

157-M. Electron Diffraction and Microscopy of Metals. R. D. Heidenreich. Paper from "Modern Research

Techniques in Physical Metallurgy". American Society for Metals, p. 51-71.

Reviews techniques and methods of examining metal surfaces by electron diffraction and electron microscopy. Diagram, graph, electron diffraction patterns. 19 ref. (M22, M21)

158-M. X-Ray Diffraction Techniques. Charles S. Barrett. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 72-94.

Considers high intensity and high brilliance X-ray tubes, monochromators and various types of counting tubes for intensity measurement. Oscillogram, diagrams, microradiograph. 55 ref. (M22)

159-M. The Diffuse Scattering of X-Rays. B. E. Warren and B. L. Averbach. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 95-130.

Scattering in a metal or alloy with cubic structure for disorder data. Diagrams, graphs, tables. 22 ref. (M22)

160-M. Crystal Orientation and Pole Figure Determination. A. H. Geisler. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 131-153.

Studies of mechanical and physical properties, deformation, recrystallization, grain growth, solid-state transformations, corrosion rates and diffusion frequently involve crystal orientation determination. Photographs, diagrams, graphs. 34 ref. (M23)

161-M. Techniques and Applications of Neutron Diffraction. C. G. Shull. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 154-169.

Compares neutron, X-ray and electron diffraction techniques. Usefulness of neutron techniques by series of applications. Table, graphs, diagrams, photograph. 11 ref. (M22)

162-M. Ferromagnetic Domains. H. J. Williams. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 251-277.

Magnetic domain structures can be observed and changes in structures can be followed as an applied magnetic field is varied. Effect of stress can also be observed. Diagrams, micrographs, graph. 23 ref. (M27, P16)

163-M. Radioactive Tracers in Physical Metallurgy Research. Michael B. Bever. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 278-311.

Reviews fundamentals of radioactivity and presents tracer techniques suitable for metallurgical research. Micrographs. 157 ref. (M23)

164-M. Radiation Damage as a Metallurgical Research Technique. Sidney Siegel. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 312-324; disc., p. 325.

Copper, order-disorder alloys and precipitation hardening alloys referred to in use of this method. Diagram, graphs, table. 16 ref. (M23, Cu)

165-M. (French.) Ultra-Rapid Micrographic Examination of Copper and Its Alloys. P. A. Jacquet. *Cuivre Laitons, Alliages,* 1953, no. 16, Nov.-Dec., p. 49-55.

Microstructure of all common copper-base materials can be revealed with an automatic polishing apparatus. Method permits shop control of production. Photograph, table, micrographs. 6 ref. (M21, Cu)

166-M. (German.) **Investigation of Electrolytic Condenser Foils.** L. Holik and H. Nowotny. *Metall,* v. 8, nos. 5-6, Mar. 1954, p. 180-184.

Evaluation of experiments on etching of aluminum foils for X-ray and metallographic examination. Graphs, tables, micrographs, photographs. 7 ref. (M21, Al)

167-M. Progress of the Physics of Solids. Frederick Seitz. *Applied Mechanics Reviews,* v. 7, Apr. 1954, p. 137-138.

Imperfection-determined properties of crystals can be understood in terms of six primary imperfections. (M26)

168-M. Investigation of the Degree of Perfection of a Crystal by Means of Polarized X-Rays. S. Ramaseshan and G. N. Ramachandran. *Indian Academy of Sciences, Proceedings,* v. 39, sec. A, Jan. 1954, p. 20-30.

Investigates intensity of Bragg reflection when incident X-rays are polarized and azimuth of electric vector is varied with respect to plane of reflection. Tables, graphs, diagrams. 11 ref. (M26, M22)

169-M. A Simple Method for the Precision Measurement of Lattice-Constants. H. J. Goldschmidt. *Journal of Scientific Instruments,* v. 31, Mar. 1954, p. 82-83.

Instrument for accurate measurement of lattice-spacings on X-ray

powder photographs simulates geometric conditions existing on camera while pattern is obtained. Diagram. 4 ref. (M26, M22)

170-M. An Electron Diffraction Apparatus With a New Electron Optical System Designed for the Examination of Surface Structure. C. S. Lees. *Journal of Scientific Instruments,* v. 31, Mar. 1954, p. 84-86.

Apparatus and operating characteristics. Diagrams. 6 ref. (M22)

171-M. Some Relations for Crystals With Substructures. M. J. Buerger. *National Academy of Sciences of the United States of America, Proceedings,* v. 40, Feb. 1954, p. 125-128.

Presence of substructure gives rise to specialized X-ray diffraction effects. Patterson map and reciprocal lattice have specialized features which may be recognized. Diagrams. 6 ref. (M22, M26)

172-M. (Russian.) **X-Ray Investigation of Alloys in the System Aluminum-Palladium.** Iu. P. Simanov. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 10, Oct. 1953, p. 1503-1509.

Test specimens prepared from fine filings pressed into cylinders. Tables. 6 ref. (M24, Al, Pd)

173-M. (Book.) **Electron Optics.** O. Klemperer. 2nd Ed. Cambridge Monographs on Physics. 471 p. 1953. Cambridge University Press, Cambridge, England. $9.50.

Principles, methods, and applications. Covers lenses, emission systems, deflecting fields, and uses of electron microscopy in research and industry. (M21, M22)

174-M. (Book.) **Manual of the Polarizing Microscope.** A. F. Hallimond. 204 p. 1953. Cooke, Troughton & Simms, Ltd., York, England. 15/.

Designed as guide for use of Cooke microscopes. Description of design and accessories. (M21)

175-M. Drift Mobilities in Semiconductors. II. Silicon. M. B. Prince. *Physical Review,* v. 93, ser. 2, Mar. 15, 1954, p. 1204-1206.

Mobility of holes in *n*-type silicon and electrons in *p*-type silicon measured as functions of impurity concentration and temperature. Graphs. 3 ref. (M25, Si)

176-M. Contribution to System Tungsten Carbide-Titanium Carbide-Chromium Carbide. O. Rüdiger. *Henry Brutcher, Altadena, Calif., Translation no.* 3220, 7 p. (From *Metall,* v. 7, nos. 23-24, 1953, p. 967-969.)

Previously abstracted from original. See item 67-M, 1954. (M24, W, Ti, Cr)

177-M. (English.) **Origin of Spiral Eutectic Structures.** R. L. Fullman and D. L. Wood. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 188-193.

Structures in which two phases appear as intertwined spirals in cross section were observed in zinc-magnesium and aluminum-thorium alloys. Diagrams, graph, micrographs. 2 ref. (M27, N12, Zn, Mg, Al, Th)

178-M. (English.) **Thermodynamics of the Liquidus and the Solidus of Binary Alloys.** Carl Wagner. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 242-249.

If free energies of liquid and solid phase of binary alloy are given as functions of composition and temperature, liquidus and solidus may be derived from condition that partial molar free energies of each component must be equal in coexisting phases. 30 ref. (M24, P12)

179-M. (English.) **Oxide Growth on Different Crystal Faces of Aluminium.** S. J. Basinska, J. J. Polling and A. Charlesby. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 313-317.

Estimates of oxide thicknesses made by goniometer measurements and X-ray diffraction methods. Table, diagrams. 3 ref. (M26, M22, M23, Al)

180-M. (English.) **Recent Observations on the Motion of Small Angle Dislocation Boundaries.** Douglas W. Bainbridge, Choh Hsien Li and Eugene H. Edwards. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 322-333.

Boundaries in zinc crystals investigated in temperature range −196 to 400° C. Boundaries moved by application of shear stress. Photogoniometers, diagrams, photographs, graphs. 7 ref. (M26, Zn)

181-M. (English.) **On the Origin of Screw Dislocations in Growing Crystals.** *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 344-346.

Mechanism is suggested to arise from impingement of two crystals. 4 ref. (M26)

182-M. (English.) **Faulting in Austenite.** H. M. Otte. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 349-352.

Markings in austenite which delineate the (111) planes are best interpreted in terms of stacking faults, detectable by X-ray diffraction techniques. Micrographs, diagrams. 4 ref. (M26, M22)

183-M. (English.) **The Interaction of Impurity Atoms With Dislocations in Germanium.** A. D. Kurtz and S. A. Kulin. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 352-354.

Existence of dislocations in germanium gives rise to certain specific distributions of solute atoms. Approximate calculation and model is suggested. Table. 4 ref. (M26, Ge)

184-M. (English.) **Effect of Dislocations on Minority Carrier Lifetime in Germanium.** S. A. Kulin and A. D. Kurtz. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 354-356.

Densities measured by X-ray and metallographic methods. Results correlated with measurements of lifetime of minority carriers. Diagram, graph. 4 ref. (M26, P10, Ge)

185-M. (French.) **Electron Structure of Impurities in Metals.** J. Friedel. *Annales de physique,* v. 9, 12me Serie, Mar.-Apr. 1954, p. 158-202.

Configuration of electrons around an impurity studied with respect to molecular energy levels, valence energy levels and ion configurations. Graphs, diagrams, tables. 93 ref. (M25)

186-M. (French.) **Relation Between Structure and Mechanical Properties During the Hardening of Aluminum-Silver Alloy.** Bella Belbeoch and André Guinier. *Comptes rendus,* v. 238, no. 9, Mar. 1, 1954, p. 1003-1005.

X-ray study of an aluminum alloy with 38% silver. Graph. 3 ref. (M27, Q general, Al, Ag)

187-M. (French.) **Metallography of Cobalt-Base and Metallic-Carbide-Base Alloys.** René Bernard and Colette Berger. *Comptes rendus,* v. 238, no. 11, Mar. 15, 1954, p. 1224-1226.

Specimens were diamond polished and treated with hydrochloric and sulfuric acids and hydrogen peroxide. Constituents were readily distinguishable. Micrographs. 2 ref. (M27, M21, Co, Ni)

188-M. (French.) **Improvement in the Oxidation Method Enabling True Austenite Grains to be Revealed in Steel.** A. Kohn. *Revue de métallurgie,* v. 51, no. 2, Feb. 1954, p. 129-137.

Method overcomes drawbacks of cementation method. Procedure uses preferential diffusion of oxygen along austenite grain boundaries. Micrograph, table. 11 ref. (M27, ST)

189-M. (French.) **Effect of Additions of Zirconium on Crystal Structure of Extruded and Heat Treated Aluminum Alloy Semi-Finished Products.** J. Hérenguel and M. Scheidecker. *Revue de métallurgie,* v. 51, no. 3, Mar. 1954, p. 173-178.

Small additions produce satisfactory results for improved quality of semifinished products and widened scope of subsequent operations. Graphs, photographs, diagrams. 3 ref. (M26, Zr, Al)

190-M. (Russian.) **Calculation of Intensity of the X-Ray Background at Various Degrees of Correlation in Solid Solutions.** Iu. A. Bagariatskii. *Doklady Akademii Nauk SSSR,* v. 93, no. 1, Nov. 1, 1953, p. 35-38.

Verifies formula found by Lifshits and Obraztsov. Diffused maxima arise under clear selective maxima. 11 ref. (M22)

191-M. Titanium-Nitrogen and Titanium-Boron Systems. A. E. Palty. H. Margolin and J. P. Nielsen. *American Society for Metals, Transactions,* v. 46, 1954, p. 312-328.

On basis of metallographic, X-ray diffraction and melting-point data, Ti-N and Ti-B phase diagrams were delineated in respective composition regions up to 17.5% nitrogen and 33% boron. Graphs, micrographs, tables. 20 ref. (M24, Ti, B)

192-M. The Phase Diagram of the System InAs-Sb. C. Shih and E. A. Peretti. *American Society for Metals, Transactions,* v. 46, 1954, p. 389-396.

Thermal analysis, metallographic and X-ray data. Graph, table, micrographs. 7 ref. (M24, In, As, Sb)

193-M. The Angular-Appearing Carbides in High Speed Tool Steels. Carl J. McHargue, Joseph P. Hammond and Charles S. Crouse. *American Society for Metals, Transactions,* v. 46, 1954, p. 716-726.

Particles present in high speed toolsteels after overheating were studied in steels of types 18-4-1 and 6-5-4-2. They were found to be of same crystal structure and probably of similar composition as carbides ordinarily reported for these steels. Tables, micrographs, graph. 11 ref. (M26, TS)

194-M. A Magnetic Method for the Determination of Gamma-Loops in Binary Iron Alloys and Its Application to the Iron-Silicon System. J. Crangle. *British Journal of Applied Physics,* v. 5, Apr. 1954, p. 151-154.

New method of phase analysis depends on measurements of paramagnetic susceptibility at different temperatures above the Curie point. Graphs, tables. 10 ref. (M24, M23, Fe)

195-M. Silver-Uranium System. R. W. Buzzard, D. P. Fickle and J. J. Park. *Journal of Research, National Bureau of Standards,* v. 52, Mar. 1954, p. 149-152.

Phase diagram constructed from data obtained by thermal analysis, metallographic examination and X-ray diffraction. Tables, graphs, micrographs, photograph. 5 ref. (M24, Ag, U)

196-M. X-Ray Diffraction Methods in the Appraisal of Nickel-Iron Powder-Cores. N. C. Tombs. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 197-201 + 6 plates; disc., p. 201.

X-ray techniques appraise magnetic powder cores made of 80-20 alloy by reduction process. Radiograms. (M22, P16, H11, Ni, Fe)

197-M. (German.) **The Three-Component System Titanium-Tungsten-Carbon.** Hans Nowotny, Erwin Parthé, Richard Kieffer and Friedrich Benesovsky. *Zeitschrift für Metallkunde,* v. 45, no. 3, Mar. 1954, p. 97-101.

Structure explained by X-ray diffraction and determination of melting points. Graphs, diagrams. 12 ref. (M24, Ti, W)

198-M. (German.) **Crystalline Form of Tungsten Carbide and the Distribution of Carbon Atoms in the Lattice.** Hans Pfau and Walter Rix. *Zeitschrift für Metallkunde,* v. 45, no. 3, Mar. 1954, p. 116-118.

Investigation indicated probable location of carbon atoms. Photographs. 3 ref. (M26, W)

199-M. (German.) **The Structure of Amorphous Antimony.** H. Richter, H. Berckhemer and G. Breitling. *Zeitschrift für Naturforschung,* v. 9a, no. 3, Mar. 1954, p. 236-252 + 2 plates.

Preparation by vapor-deposition. Studies by X-ray method. Diagrams, graphs, tables, photographs, micrographs. 31 ref. (M26, Sb)

200-M. (Russian.) **Investigation of Plastically Deformed Crystals by Means of a Narrow Beam of X-Rays.** E. V. Kolontsova. *Doklady Akademii Nauk SSSR,* v. 93, no. 5, Dec. 11, 1953, p. 795-798 + 1 plate.

X-ray diffraction photographs utilizing a glass diaphragm with a slit of 10 to 15 microns width. Materials studied were monocrystals of tin, cadmium, zinc, aluminum, nickel and silver chloride. Graph, micrographs. (M22, Sn, Cd, Zn, Al, Ni)

201-M. The Transition Metals and Their Alloys. W. Hume-Rothery and B. R. Coles. *Advances in Physics,* v. 3, Apr. 1954, p. 149-242.

Physical properties, atomic and co-valent radii, electro theory, alloys with aluminum and electronic structures. Graphs, tables, diagrams. 136 ref. (M25, P general)

202-M. X-Ray Anti-Reflections in Crystals. II. Calculation of the Integrated Reflection and Integrated Anti-Reflection for an Internal Reflection. G. N. Ramachandran. *Indian Academy of Sciences, Proceedings,* v. 39, sec. A, Feb. 1954, p. 65-80.

Mathematical study of variations in reflected and transmitted intensities with various factors such as absorption coefficient, structure factor asymmetry and thickness of crystal. 12 ref. (M26, P10)

203-M. Use of Electrons in the Examination of Metals. A. G. Quarrell. *Metal Treatment and Drop Forging,* v. 21, Apr. 1954, p. 153-160, 167.

Development of electron microscope and of its use by the metallurgist. Diagrams, radiograms. 14 ref. (M21)

204-M. (French.) **New Method of Etch Pit Formation on Iron Surfaces.** Jean Bardolle and Jean Moreau. *Comptes rendus,* v. 238, no. 13, Mar. 29, 1954, p. 1416-1418.

Tests conducted in aqueous solutions of NH_4CNS. Electrolytic method. Micrographs. 14 ref. (M21, Fe)

205-M. (German.) **The Electrochemical Processes in Electrolytic Separation of Structural Components of Steel With A.C. Current.** Walter Koch, Ilse Ramsauer and Mark v. Stackelberg. *Archiv für das Eisenhüttenwessen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 93-106.

Deficiency of current yield in isolation with square wave a.c. current; effect of structure on this deficiency and different variables on voltage and current-density curves. Diagrams, graphs, micrographs. 26 ref. (M23, ST)

206-M. (Book.) **Applied Electron Microscopy.** Robert B. Fischer. 231 p. 1953. Indiana Univ. Press, Bloomington, Ind. $4.85.

Specimen preparation and description of representative pictures. Equations are given, and comparison made between electron and light microscopy. (M21)

207-M. (Book.) **The Crystalline State. The Determination of Crystal Structures.** H. Lipson and W. Cochran. v. III. 345 p. 1953. G. Bell & Sons, Ltd., London W.C.2, England. 50s.

Determination of structures and construction of electron density maps for deriving atomic positions. (M26)

208-M. (Book.) **Introduction to Electron Microscopy.** Cecil E. Hall. 451 p. 1953. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y. $9.00.

Essential elements of physical theory. Microscope construction, nature of images and preparation of specimens and selected samples. (M21)

209-M. Valence Bond Calculations. L. A. Schmid. *American Journal of*

Physics, v. 22, May 1954, p. 255-263.

Nature of binding in molecular and ionic crystals and in metals. Features of the Slater-Pauling theory. Diagrams. 7 ref. (M26)

210-M. Studies on the Texture of Crystals. I. NaCl, KCl and MgO. V. M. Padmanabhan. *Indian Institute of Science, Journal,* v. 36, sec. A, Apr. 1954, p. 104-110 + 1 plate.

X-rays of cubic crystals suggest new method of texture study. Graphs, photographs. 11 ref. (M26, M23)

211-M. Thermionic and Surface Properties of Tungsten Crystals. George F. Smith. *Physical Review,* v. 94, ser. 2, Apr. 15, 1954, p. 295-308.

Plateau-like surface structure found. "Shingle" structure observed superimposed upon plateaus. Photograph, micrographs, tables, graphs, diagrams. 40 ref. (M26, P15, W)

212-M. Interferometric Observation of Mosaic Structure on the (111) Face of a Single Crystal of Germanium. Ajit Ram Verma. *Physical Society, Proceedings,* v. 67, no. 412B, Apr. 1, 1954, p. 359-360 + 1 plate.

Surface study by microscopic and interferometric techniques. Micrographs. 5 ref. (M26, Ge)

213-M. (French.) **An Electrolytic Method of Producing Etch Patterns on Alpha Copper-Zinc Solid Solutions.** Pierre A. Jacquet. *Comptes rendus,* v. 238, no. 14, Apr. 5, 1954, p. 1508-1510.

Solution of 2% sodium hyposulfate heated to 50° C. reveals traces of plastic deformation and polygonization. Micrographs. 4 ref. (M21, Q24, Cu, Zn)

214-M. (Italian.) **Examination of Metal Surfaces With the Electron Microscope and by Electron Diffraction. Experimental Part.** K. Huber. *Metallurgia italiana,* v. 46, no. 2, Feb. 1954, p. 41-48.

Methods used on zinc surfaces. Diffraction patterns, micrographs. (M21, M22, Zn)

215-M. (Russian.) **Superheating of a Solid Body in Vacuum.** D. S. Kamenetskaia and I. B. Piletskaia. *Doklady Akademii Nauk SSSR,* v. 94, no. 4, Feb. 1, 1954, p. 689-691.

Constitution diagrams of magnesium, zinc, cadmium, manganese and aluminum in pressure-temperature coordinates. Graph, table. 2 ref. (M24, Mg, Zn, Cd, Mn, Al)

216-M. (Russian.) **Electron Diffraction Investigation of Thin Films of Silver.** A. I. Bublik. *Doklady Akademii Nauk SSSR,* v. 95, no. 3, Mar. 21, 1954, p. 521-523 + 1 plate.

Observations of hexagonal lattice. Dependence of film structure on rate of evaporation and thickness of film. Tables, photographs. 6 ref. (M22, Ag)

217-M. (Russian.) **Electronographic Investigation of Structure of Cubic Iron Nitride.** Z. G. Pinsker and S. V. Kaverin. *Doklady Akademii Nauk SSSR,* v. 95, no. 4, Apr. 1, 1954, p. 797-799 + 1 plate.

Instrument and method of investigation permits differentiation of lines. Table, radiograms. 2 ref. (M21, Fe)

218-M. (Russian.) **Diagram of Solubility of the System Ni-Cr-NiAl.** I. I. Kornilov and R. S. Mints. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1085-1088 + 1 plate.

Microstructure and thermal analysis studies. Diagram, micrographs. 6 ref. (M24, Ni, Cr, Al)

219-M. (Russian.) **X-Ray Analysis of Structure of Chips Resulting From Metal Cutting.** S. I. Gubkin and L. T. Mendeleev. *Doklady Akademii Nauk SSSR,* v. 95, no. 1, Mar. 1, 1954, p. 73-74 + 1 plate.

Copper, aluminum, bronze and steel chips show same structure as forged, rolled or stamped parts. Radiograms. 2 ref. (M27, G17, Cu, Al, ST, Zn)

220-M. (Russian.) **Adsorption of Additions on the Boundaries of Blocks in Aluminum.** I. E. Bolotov and Iu. D. Kozmanov. *Doklady Akademii Nauk SSSR,* v. 95, no. 2, Mar. 11, 1954, p. 293-295.

Investigation indicates adsorption of iron and silicon between mosaic blocks in critically deformed commercial grade aluminum. 2 ref. (M26, Al)

221-M. (Russian.) **Problem of the Compound Ni_3Cr.** I. I. Kornilov and R. S. Mints. *Doklady Akademii Nauk SSSR,* v. 95, no. 3, Mar. 21, 1954, p. 543-545.

Microstructural analysis, electrical resistance, dilatometry and X-ray phase analysis. Table, graphs. 6 ref. (M27, M23, M24, P15, Cr, Ni)

222-M. (Russian.) **New Method of Producing Test Specimens of Varying Composition and Possibilities for Its Application.** D. A. Petrov and A. A. Bukhanova. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 1, Jan. 1954, p. 161-173 + 2 plates.

Extraction of solid phase from aluminum-copper alloy melts to

study phase relations in complex mixtures. Diagrams, graphs, micrographs. 2 ref. (M23, Al, Cu)

223-M. (English.) **The Determination of the Ms Temperature by Dilatometric Method.** Hideo Nishimura and Toshishige Mitani. *Memoirs of the Faculty of Engineering, Kyoto University,* v. 16, no. 1, Jan. 1954, p. 1-7.

Technique for accurate determination. Graphs, diagrams, micrographs. 2 ref. (M23, ST)

224-M. **Statistical Mechanics of Two-Component Interstitial Solid Solutions.** A. L. G. Rees. *Faraday Society, Transactions,* v. 50, Apr. 1954, p. 335.

Theory is applicable to any nonstoichiometric system in which one component is volatile or gaseous. Graphs. 8 ref. (M26)

225-M. **A Redetermination and Interpretation of the Titanium-Rich Region of the Titanium-Chromium System.** M. K. McQuillan. *Institute of Metals, Journal,* v. 82, May 1954, p. 433-439 + 1 plate.

Phase boundaries in composition range 0.14 at. % chromium. Present and previous micrographic results differ due to insufficiently rapid quenching in earlier experiments. Diagram, micrographs. 13 ref. (M24, Ti, Cr)

226-M. **X-Ray Determination of the Alpha-Phase Boundary of the Copper-Indium Alloys System.** R. O. Jones and E. A. Owen. *Institute of Metals, Journal,* v. 82, May 1954, p. 445-448.

Maximum solubility of indium in copper is 10.85 at. % and is found to occur at 575° C. Boundary below 575° C. shows a point of inflection, suggesting a transformation at about 470° C. Tables, graph. 8 ref. (M24, Cu, In)

227-M. **The System Uranium-Mercury.** B. R. T. Frost. *Institute of Metals, Journal,* v. 82, May 1954, p. 456-462.

Alloy system examined over composition range from −40 to 1000° C. by means of X-ray, thermal and low-temperature micrographical analysis. Diagrams, tables. 15 ref. (M24, U, Hg)

228-M. **The Ternary Compound *E* in the System Aluminium-Chromium-Magnesium.** K. Little. *Institute of Metals, Journal,* v. 82, May 1954, p. 463-464.

Single crystals of approximate composition $CRMg_{1.5}Al_{12}$ were examined goniometrically and by X-rays. Micrographs. 5 ref. (M26, Al, Cr, Mg)

229-M. **A Simple Method of Obtaining Low-Temperature X-Ray Diffraction Photographs.** S. C. Wallwork and T. T. Harding. *Journal of Scientific Instruments,* v. 31, May 1954, p. 163-164.

Crystal mounted in the usual way on an oscillation goniometer may be maintained at a temperature of −30 to −60° C. No precautions against ice formation necessary. Diagram. 16 ref. (M22)

230-M. **Metallography With the Electron Microscope.** J. Nutting. *Metal Treatment and Drop Forging,* v. 21, May 1954, p. 243-250.

Capabilities, aims and limitations of instruments. Micrographs, table, diagrams. 18 ref. (M21)

231-M. **On the Structure of Crystals of Martensite in Hardened Steel.** M. P. Arbuzov, L. I. Lysak and E. G. Nesterenko. *National Science Foundation Translation, no.* 153, Jan. 1954, 3 p. (From *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 375-377.)

Previously abstracted from original. See item 415-M, 1953. (M22, M26, CN)

232-M. **A Remarkable Etching of Copper.** J. J. de Jong. *Philips Technical Review,* v. 15, Feb.-Mar. 1954, p. 238-240.

Principles and process of preparing metal for microscopic examination. Photomicrograph. 3 ref. (M21, Cu)

233-M. (French.) **The Appearance of a Particular Type of Surface Microstructure in a Nickel-Chromium Alloy Subjected to Selective Oxidation Reaction.** Jacques Benàrd and Jean Moreau. *Comptes rendus,* v. 238, no. 16, Apr. 21, 1954, p. 1659-1661.

Changes in surface under various atmospheres and temperatures. Micrographs. 4 ref. (M27, Ni, Cr)

234-M. (French.) **Examination of Superfinish Mechanism in the Electron Microscope.** Noboru Takahashi and Toshio Asaeda. *Métaux, Corrosion—Industries,* v. 29, no. 343, Mar. 1954, p. 95-99.

Studies of ground and superfinished high-chromium and carbon steels. Graphs, micrographs. 4 ref. (M27, G19, CN, AY)

235-M. (French.) **Evolution of Structure and Properties During Tempering of Rolled Alloy RR57.** Ch. Renon-Changarnier and J. Calvet. *Recherche Aéronautique,* 1954, no. 38, Mar.-Apr. p. 23-42.

Stabilization of Al_2Cu precipitates by manganese and titanium in aluminum-copper sheets tempered at

various temperatures. Tables, graph, micrographs. 13 ref. (M27, J29, Al, Cu)

236-M. (German.) **The Behavior of Oxygen Towards Molten Silver-Lead Alloys.** Ernst Justus Kohlmeyer and Helmut Hennig. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 4, Apr. 1954, p. 153-161.

Effects of oxygen on structure of various alloys. Photographs, tables, graphs, micrographs. 16 ref. (M27, Pb, Ag)

237-M. (Italian.) **Phase-Contrast Microscopy in Metallography and Mineralogy.** R. Mitsche. *Mettallurgia italiana,* v. 46, no. 3, Mar. 1954, p. 79-84.

Techniques and etchants for various materials. Photographs, micrographs. (M21, SS, Cr, W, V, Ni)

238-M. (Russian.) **Electronographic Investigation of Thin Films of Mg-Sb, Mg-Bi, and Mg-Sn Alloys.** G. A. Kurov and Z. G. Pinsker. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 439-441 + 1 plate.

Electronograms obtained by reflection and "passage", using metal films sublimated on thin celluloid strips. Photograph. 3 ref. (M23, Mg, Sb, Bi, Sn)

239-M. (Russian.) **New Method of Observing Ultra-Fine Elements of Relief of a Crystal Face.** G. G. Lemmlein and N. V. Gliki. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 473-475 + 1 plate.

Electronographic investigation of structure of ammonium chloride "dew" on faces of silicon carbide crystals shows spiral-layer structure is characteristic of these crystals. Photographs, diagrams. 4 ref. (M23, M26)

240-M. (Spanish.) **Metallographic Identification of the Sigma Phase in One Ferritic Chromium Steel and Two Austenitic Chromium-Nickel Steels. I. Introduction. Experiences With Ferritic Chromium Steel.** Francisco Joanxich Ayma. *Revista de ciencia aplicada,* v. 8, no. 36, Jan.-Feb. 1954, p. 18-34.

Formation of sigma phase between 500 and 800° C. and its effect on hardness. Graphs, micrographs, tables. (M27, Q29, AY, SS)

241-M. **Sigma—an Unwanted Constituent in Stainless Weld Metal.** Lorin K. Poole. *Metal Progress,* v. 65, June 1954, p. 108-112.

Formation. Control, either by selection of proper electrode or by periodic high-temperature heat treatment. Identification of sigma. Micrographs, graphs. (M26, K1, SS)

242-M. **Structure of Optically Active Compounds in the Solid State.** J. M. Bijvoet. *Nature,* v. 173, May 15, 1954, p. 888-891.

Heavy-atom technique of phase determination in form of isomorphous substitution method. Diagrams. 10 ref. (M23)

243-M. **On the Theory of X-Ray Small-Angle Scattering.** Yin-Yuan Li and R. Smoluchoski. *Physical Review,* v. 94, ser. 2, May 15, 1954, p. 866-871.

Analysis of scattering in a supersaturated aluminum-silver alloy. Approximate formulas which fit experimental data. Graphs. 16 ref. (M22, Al, Ag)

244-M. (English.) **Morphology of ZnO Crystals Formed on the Surface of Brass or Zinc at High Temperatures.** Riitsu Takagi. *Physical Society of Japan, Journal,* v. 9, no. 2, Mar.-Apr. 1954, p. 162-168.

Electron-microscope shows thin needles projecting on surface of brass or zinc heated in air. Micrographs, radiograms, diagrams. 20 ref. (M26, Cu, Zn)

245-M. (English.) **Fine Structure Due to Refraction Effect in Electron Diffraction Pattern of Powder Sample. II. Multiple Structures Due to Double Refraction Given by Randomly Oriented Smoke Particles of Magnesium and Cadmium Oxide.** Goro Honjo and Kazuhiro Mihama. *Physical Society of Japan, Journal,* v. 9, no. 2, Mar.-Apr. 1954, p. 184-198.

Experimental study. Tables, graphs, diagrams, micrographs. 16 ref. (M22)

246-M. (English.) **Some Remarks on the Role of Overlapping in the X-Ray Scattering by Crystals.** I. Waller and S. O. Lundqvist. *Arkiv för Fysik,* v. 7, nos. 1-2, Jan. 30, 1954, p. 121-124.

Effect in a first approximation of overlapping between neighboring atoms or ions in a crystal consisting of atoms or ions having complete electron shells. Table, graph. (M26)

247-M. (French.) **Study of the Hexagonal Carbonitride of Iron (Fe_3N Type).** R. Bridelle and A. Michel. *Revue de métallurgie,* v. 51, no. 4, Apr. 1954, p. 278-282; disc., p. 282.

Structural and thermomagnetic study of lattice parameters and Curie point variation with carbon and nitrogen content. Graphs, tables. 4 ref. (M26, P16, Fe)

248-M. **The Solid Solubility of Phosphorus in Iron.** H. Schrader and B. N. Bose. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 104-136.

Thermodynamic computation on

reliability of gamma phase boundary and solubility lines of diagram. Graphs. 26 ref. (M24, P, Fe)

249-M. Some Micrographic Investigations by Etch Figures on Commercially Pure Aluminium. E. G. Ramachandran and N. J. Wadia. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 344-349; disc., p. 349-350.

Shape and distribution of etch pits in relation to crystallographic orientation and grain boundary structures. Micrographs, photographs, diagram. 8 ref. (M27, Al)

250-M. The Constitution of Gold-Molybdenum Alloys, With Particular Reference to the Solubility of Molybdenum in Gold. G. A. Geach and D. Summers-Smith. *Institute of Metals, Journal,* v. 82, June 1954, p. 471-474.

X-ray powder photography and lattice-parameter measurements up to 800° C. Graphs, tables. 11 ref. (M24, Au, Mo)

251-M. Methods for Determining the Liquidus Points of Titanium-Rich Alloys. W. Hume-Rothery and D. M. Poole. *Institute of Metals, Journal,* v. 82, June 1954, p. 490-492 + 1 plate.

Preparation and testing methods. Diagram, graph, micrographs. 1 ref. (M24, Ti, Ni, Cu, Sn)

252-M. Successive Orientational Transitions in Crystals. Theodore J. Krieger and Hubert M. James. *Journal of Chemical Physics,* v. 22, May 1954, p. 796-814.

Extended discussion of crystal model, consisting of an array of classical rotators with next-neighbor coupling. Graphs, tables. 20 ref. (M26)

253-M. Solution of the Schrödinger Equation in Periodic Lattices With an Application to Metallic Lithium. W. Kohn and N. Rostoker. *Physical Review,* v. 94, ser. 2, June 1, 1954, p. 1111-1120.

Variation-iteration method applied in solving a major problem in band theory of solids. Tables, graph. 15 ref. (M26, Li)

254-M. Structure of Gd, Dy, and Er at Low Temperatures. J. R. Banister, S. Legvold and F. H. Spedding. *Physical Review,* v. 94, ser. 2, June 1, 1954, p. 1140-1142.

Crystal structures of gadolinium, dysprosium and erbium metals determined over wide temperature range. Tables, graphs. 15 ref. (M26, Gd, Dy, Er)

255-M. A Pressurized High-Temperature Debye-Scherrer Camera, and Its Use to Determine the Structures and Coefficients of Expansion of Gamma and Delta Manganese. Z. S. Basinski and J. W. Christian. *Royal Society, Proceedings,* v. 223, ser. A, May 20, 1954, p. 554-560.

Structures of gamma and delta manganese found to be face-centered cubic and body-centered cubic, respectively. Mean values of linear coefficients of thermal expansion of the phases over their regions of stability, and volume changes resulting from transformations. Diagram, graphs. 5 ref. (M22, P11, Mn)

256-M. Survey of Portions of the Chromium - Cobalt - Nickel - Molybdenum Quaternary System at 1,200° C. Sheldon Paul Rideout and Paul A. Beck. *U. S. National Advisory Committee for Aeronautics, Report* 1122, 1953, 38 p.

Determination of boundaries of face-centered cubic (alpha) solid solutions and of phases co-existing with alpha. Tables, graphs, micrographs. 24 ref. (M24, Cr, Co, Ni, Mo)

257-M. (French.) **Particular Aspects of Study of Thin Metal Sections.** Raymond Castaing and Paul Laborie. *Comptes rendus,* v. 238, no. 19, May 10, 1954, p. 1885-1887.

Importance of preliminary treatment of metal for electron diffraction studies. Micrographs. 1 ref. (M22, Al, Cu)

258-M. (French.) **Effect of Distortion of Lattice on Diffusion of X-Rays by Solid Solutions.** André Guinier. *Comptes rendus,* v. 238, no. 19, May 10, 1954, p. 1898-1900.

Calculation of diffusion caused by alloy having atoms of different diameters. Aluminum-copper alloys studied. (M22, Al, Cu)

259-M. (German.) **Electrolytic Polishing of Metals. Fundamentals and Applications of Electrolytic Polishing in Science and Technology.** P. A. Jacquet. *Metall,* v. 8, nos. 11-12, June 1954, p. 449-458.

Concept of surface quality. Electropolished surfaces show true structure of the metal. Micrographs, graphs, tables, photographs. 69 ref. (M21, L13)

260-M. Electron Micrographs of Crystal Boundary and Sub-Boundary Structures in Steels and Ingot Irons. E. W. Williams and H. O'Neill. *Iron and Steel Institute, Journal,* v. 177, June 1954, p. 224-228 + 5 plates.

Aging effects in rimming steel; structural features of Armco iron; intergranular features in a nickel-chromium-molybdenum steel. Tables, micrographs, phase diagram. 26 ref. (M21, M27, CN, AY, Fe-a)

261-M. High-Resolution Replicas and Their Application. Tadatosi Hibi and Keiji Yada. *Journal of Applied Physics,* v. 25, June 1954, p. 712-719.

Resolution of two-step replicas becomes better by using zirconium, silicon, germanium and chromium in place of aluminum on methyl methacrylate - aluminum replicas. Micrographs, diagram, table. 12 ref. (M21, Al, Zr, Si, Ge, Cr)

262-M. Electron Diffraction. Uses and Limitations in the Study of Metals. J. W. Menter. *Metal Treatment and Drop Forging,* v. 21, June 1954, p. 289-294.

Determination of lattice and crystal structure and microgeometry of surfaces. 37 ref. (M22, M26)

263-M. Crystal Structure of the Intermetallic Compound $Mg_3Cr_2Al_{18}$. Sten Samson. *Nature* v. 173, June 19, 1954, p. 1185-1186.

X-ray diffraction data. Table. 3 ref. (M26, Al, Cr, Mg)

264-M. Anisotropy of Distortions of Crystal Lattice of Martensite. V. A. Il'ina, V. K. Kritskaya and G. V. Kurdyumov. *Henry Brutcher, Altadena, Calif., Translation no.* 3080, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 85, no. 5, 1952, p. 997-999.)

Study of true cause of weakening of intensity of certain doublet lines on X-ray photographs of martensite, random static deviations of iron atoms from ideal position in direction of tetragonal axis versus increase in amplitude of thermal vibrations in this direction. Table. 4 ref. (M26, M22, ST)

265-M. Structure and Properties of Nitrogen-Bearing Chromium Metal and Ferrochromium. M. L. Korolev. *Henry Brutcher, Altadena, Calif., Translation no.* 3264, 13 p. (From *Izvestiya Akademii Nauk SSSR, OTN,* 1953, no. 10, Oct., p. 1465-1470.)

Previously abstracted from original. See item 46-M, 1954. (M27, Q general)

266-M. Investigations Into the Ternary System Aluminum-Iron-Zinc. E. Gebhardt. *Henry Brutcher, Altadena, Calif., Translation no.* 3269, 17 p. (From *Zeitschrift für Metallkunde,* v. 44, no. 5, 1953, p. 206-211.)

Previously abstracted from original. See item 230-M, 1953. (M24, Al, Fe, Zn)

267-M. A Metallographic Study of Equilibrium Relationships in 3S Aluminum Alloy. Philip R. Sperry. Paper presented at Pacific Northwest Metals and Minerals Conference of the A.I.M.E., 1954, Portland, Ore. 13 p.

23 ref. (M24, Al)

268-M. X-Ray Diffraction in the Identification of Aluminum Alloys. F. R. Morral. Paper presented at Pacific Northwest Metals and Minerals Conference of the A.I.M.E., 1954, Portland, Ore. 10 p.

Includes tables. 39 ref. (M22, Al)

269-M. (English.) **Ternary Metallic Phases in the Ta-C-N, Ta-C-O and Ta-N-O Systems.** Nils Schönberg. *Acta Chemica Scandinavica,* v. 8, no. 4, 1954, p. 620-623.

Structures and compositions. Diagrams. 4 ref. (M26, Ta)

270-M. (English.) **The Composition of the Phases in the Vanadium-Carbon System.** Nils Schönberg. *Acta Chemica Scandinavica,* v. 8, no. 4, 1954, p. 624-626.

X-ray diffraction and microscopical studies of sintered mixtures. Diagram. 6 ref. (M26, M22, V)

271-M. (English.) **The Structure of the Metallic Quarternary Phase ZrTaNO.** Nils Schönberg. *Acta Chemica Scandinavica,* v. 8, no. 4, 1954, p. 627-629.

Some sections of the quaternary zirconium-tantalum-nitrogen-oxygen system investigated by X-ray methods to find whether metallic ternary and quaternary phases exist. Table. 3 ref. (M26, Zr, Ta)

272-M. (English.) **The Climb of Edge Dislocations in Face-Centered Cubic Crystals.** R. S. Barnes. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 380-385.

Dislocation properties under conditions of heating or cooling, deformation, particle bombardment and interdiffusion. Diagrams. 9 ref. (M26)

273-M. (English.) **The Tungsten Carbide and Nickel Arsenide Structures.** Nils Schönberg. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 427-432.

Studies on four ternary nitrides of the tungsten carbide structure, and two new sulfides of nickel arsenide structure. Niobium sulfide phase of nickel arsenide type is stable with an excess of sulfur, but transforms to the tungsten carbide type at low sulfur content. Tables, graphs. 20 ref. (M26, W, Ni)

274-M. (English.) **Interstitial Content of Radiation-Damaged Metals From Precision X-Ray Lattice Parameter Measurements. I. Principles of the Measurements.** Charles W. Tucker, Jr., and John B. Sampson. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 433-438; disc., p. 554.

Theory based on elasticity interpretation which predicts Vegard's law and several other experimentally confirmed X-ray effects. 22 ref. (M26)

275-M. (French.) **Modifications in Aluminum-Copper Alloys on Heating in Vacuum.** N. Takahashi and J. J. Trillat. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 409-415.

Electron diffraction studies of different film structures. Diagrams, table, micrograph, oscillograms. 8 ref. (M22, Al, Cu)

276-M. (German.) **Growth and Crystallographic Orientation of Dendrites.** J. Schlipf and A. Seeger. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 546-547.

Crystallographic characteristics of six different structures. Conditions for growth in form of formula. Graphs, table. 4 ref. (M26, N12)

277-M. (German.) **The Nitrides, Carbides, Borides, and Silicides of the Transition Metals.** Roland Kiessling. *Fortschritte der chemischen Forschung,* v. 3, no. 1, 1954, p. 41-69.

Combinations of nonmetals and transition metals and their interstitual structures. Tables, graph, diagram. 128 ref. (M26)

278-M. (German.) **The Use of Counters for Determination of Textures.** Wolfgang Bunk, Kurt Lücke and Georg Masing. *Zeitschrift für Metallkunde,* v. 45, no. 5, May 1954, p. 269-275.

Comparison of photographic and Geiger counter methods for metal textures. Photographs, graphs, table, diagrams. 11 ref. (M23, Q24, Al)

279-M. (German.) **The Position of Twinning Planes in Hexagonal CdS Crystals.** Karl-Heinz Jost. *Zeitschrift für Naturforschung,* v. 9a, no. 5, May 1954, p. 435-436 + 1 plate.

Orientation of crystallographic axis, modification and position of twinning planes determined by X-ray photographs. Diagrams, photograph. (M26)

280-M. (Polish.) **Theory of Dislocation and Properties of Metals.** W. Tomaszczyk. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 2, 1954, p. 98-104.

Fundamental features of dislocation theory. Interpretation of reoccurring of yield point after strain aging, blue brittleness, recovery and recrystallization phenomena. Graphs, diagrams. 10 ref. (M26, N5, Q23)

281-M. **The Microstructures of Various Grades of Titanium and Their Rates of Formation.** W. D. Bennett. *Canadian Journal of Technology,* v. 32, July 1954, p. 167-173 + 2 plates.

Typical microstructures of various grades of pure and impure titanium. Effects of purity and mechanical and thermal treatments on their rates of formation. Micrographs, table. 5 ref. (M27, Ti)

282-M. **Study of Exogenous Inclusions in Bottom Poured Acid Steel.** N. R. Krishnaswamy. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 77-93; disc., p. 93-94.

Analysis of chemical composition and microstructures. Inclusions were separated electrolytically. Photographs, micrographs, graphs, table. 9 ref. (M27, M28, ST)

283-M. **Equilibrium Relations in the Iron-Nitrogen System.** V. G. Paranjpe and Morris Cohen. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 173-185; disc., p. 186.

Existing data on the thermodynamics of iron-nitrogen phases combined with results of a recent determination of the iron-nitrogen phase diagram to compute the effect of pressure on this system. Graphs, table. 21 ref. (M24, Fe)

284-M. **Cathodic Vacuum Etching.** T. R. Padden and F. M. Cain, Jr. *Metal Progress,* v. 66, July 1954, p. 108-112, 162, 164.

New design of equipment using zirconium fittings and cooled cathode reduces etching time to one to three minutes in standardized routine and handles difficult compacts and couples as easily as the common metals and alloys. Diagram, micrographs. 9 ref. (M21)

285-M. **Effect of Grain Size on the Crystal Structure of Cobalt.** E. A. Owen and D. Madoc Jones. *Physical Society, Proceedings,* v. 67, no. 414B, June 1954, p. 456-466.

Lattice parameter of cobalt composed of different grain sizes as found in fine dust, filings and annealed solid rod. Tables, graph. 12 ref. (M26, Co)

286-M. (Russian.) **Methods of Studying Structures of Metals and Alloys at High Temperatures.** I. A. Oding and M. G. Lozinskii. *Vestnik Machinostroeniia,* v. 34, no. 1, Jan. 1954, p. 52-61 + 2 plates.

High-temperature vacuum metallography and methods of investigation. Diagrams, photographs, graphs, micrographs. 21 ref. (M23)

287-M. (Book.) **The Microscopy of Metals.** 132 p. 1954. The Institute of Metallurgists, 28 Victoria St., London, S.W. 1. 15s. 6d.

Microscopes and techniques; general metallography; use of polarized light in metallography; hot stage microscopy; and phase-contrast and interference metallography. (M21, M23)

288-M. (Book.) **Phase Diagrams of the Titanium-Aluminum, Titanium-Chromium-Iron, and Titanium-Oxygen Alloy Systems.** 94 p. 1952. Wright Air Development Center, U. S. Dept. of Commerce, PB 111327, Office of Technical Services, Washington 25, D. C. $2.00.

Summarizes work at Armour Research Foundation on partial phase diagrams, and methods of obtaining them. (M24, Ti, Al, Cr, Fe)

289-M. (Book.) **Relation of Properties to Microstructure.** 270 p. 1954. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. $4.00.

A seminar held during the 35th National Metal Congress and Exposition, Cleveland, Oct. 17 to 23, 1953, sponsored by the American Society for Metals. Papers individually abstracted. (M27, Q general)

290-M. (Book—French.) **(Metallic Materials. Pt. I. Generalities, Methods of Structure Examination of Metals and Alloys, Physical Methods for Study of Transformations.) Les Matériaux Métalliques. I. Généralitiés-Métodes d'Examen de la Structure des Metaux et Alliages - Methodes Physiques d'Etude des Transformations.** R. Bensimon. 103 p. 1953. Editions Eyrolles, 61 Boulevard Saint Germain, Paris. 780 fr.

Crystallographic notations, alloy structure equilibrium diagrams; investigation methods; thermal analysis. (M general)

291-M. (Book—German.) **(Electrolytic Polishing.) Electrolytisches Polieren.** H. Benninghoff. 146 p. 1953. Eugen C. Leutze Verlag, Saulgau/Wttbg. D.M. 17.50.

Processes for polishing metallographic specimens. (M21)

292-M. Diffuse X-Ray Scattering and the Physical Properties of Crystals. W. A. Wooster. *British Journal of Applied Physics,* v. 5, July 1954, p. 231-237.

Ionization and photographic methods of studying diffuse X-ray reflections. Diagrams, grating spectra. 22 ref. (M22)

293-M. An X-Ray Examination of the Indium-Rich Alloys of the Systems Indium + Lead and Indium + Mercury. C. Tyzack and G. V. Raynor. *Faraday Society, Transactions,* v. 50, July 1954, p. 675-684.

Lattice spacing relationships; changes in axial ratio; transformations from one structural type to another within very small ranges of composition. Tables, graphs, diagrams. 14 ref. (M24, Hg, Pb, In)

294-M. A Continuously Recording Electron Diffraction Camera for Studies of Crystal Structure Transitions. A. Boettcher, R. Thun, and H. Treupel. *Journal of Applied Physics,* v. 25, July 1954, p. 926-927.

Recording of rapid structure changes in solids caused by transformation and diffusion phenomena. Diagram, photograph. (M22)

295-M. Metallography. ASM Committee on Metallography. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 164-177.

Principles of the metallurgical microscope, phase contrast metallography, reflecting objectives, ultra-violet metallography, photomicrography in color, electrolytic polishing and etching, cathodic vacuum etching, and electron metallography. Diagrams, micrographs, graphs, tables. 41 ref. (M21)

296-M. X-Ray Measurements of Lattice Distortions in Martensite. (Digest of "Causes of the Weakening of the Intensity of X-Ray Interference of Martensite", by V. A. Il'ina, V. K. Kritskaya, and G. V. Kurdyumov; *Doklady Akademii Nauk SSSR,* v. 85, 1952, p. 773-775.) *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. A154, A156.

X-ray intensity measurements on quenched steels containing 0.35 and 0.41% carbon at 73 and −301° F. (M26, M22, CN)

297-M. Vacancies and Interstitials in Heat Treated Germanium. Sumner Mayburg. *Physical Review,* v. 95, ser. 2, July 1, 1954, p. 38-43.

Annealing experiments on the thermal acceptors quenched into germanium by rapid cooling from high temperature. Graphs, diagram. 21 ref. (M26, Ge)

298-M. Imperfections in Crystal Structure. Robert J. Maurer. *Record of Chemical Progress,* v. 15, no. 2, 1954, p. 61-67.

Discussion of atomic mobility in real crystals. Effect of dislocations on crystal properties. Diagrams, graph. 6 ref. (M26)

299-M. (German.) **Investigation of Electrolytic Copper Deposits With the Electron Microscope. "Aimed" Recordings.** A. Politycki. *Metall,* v. 8, nos. 13-14, July 1954, p. 526-527.

Preparation of samples and re-

cording of specified areas. Photographs, micrographs. 4 ref. (M21, M27, Cu)

300-M. (Italian.) **The Hume-Rothery Phases in Systems With More Than Two Components. IV. The Nickel-Copper-Aluminum System. (7:4).** Francesco Mazzoleni. *Metallurgia italiana,* v. 46, no. 5, May 1954, p. 185-188.

Experimental study to determine existence of a ternary Hume-Rothery phase with 7:4 ratio. Spectrograph, diagrams, tables. 14 ref. (M24, Al, Cu, Ni)

301-M. (Russian.) **Variable Structures of Copper, Nickel, and Iron Alloys.** D. Balli and M. Zakharova. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 453-456.

Theoretical calculation of interference maxima for the deformed lattice. 3 ref. (M26, Cu, Ni, Fe)

302-M. (Russian.) **Structure of Spheroidal Graphite.** Iu. N. Taran. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 507-510.

Microscopic investigation of microsections of magnesium treated cast iron. Micrographs, table, diagrams. 5 ref. (M27, CI)

303-M. (Russian.) **Electronographic Investigation of Structures of Hexagonal Nitrides of Iron.** Z. G. Pinsker and S. V. Kaverin. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 519-522 + 1 plate.

Formation observed during nitriding of ferrous films in a flow of ammonia at 250 to 650° C. Graphs, photographs. 7 ref. (M27, Fe)

304-M. (Russian.) **Structure and Homogeneity Limits of Tantalum Carbide.** V. I. Smirnova and B. F. Ormont. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 557-560.

X-ray and chemical analysis of initial and final products. Tables. 22 ref. (M26, M27, Ta)

305-M. (Russian.) **Investigation of the Structure and Properties of Cu-Ni-Fe Alloys.** D. Balli and M. I. Zakharova. *Doklady Akademii Nauk SSSR,* v. 96, no. 4, June 1, 1954, p. 737-740.

X-ray diffraction of powders. Measurement of coercivity and Curie point; changes in crystal lattice with annealing time. Graphs, tables. 2 ref. (M26, P16, Cu, Ni, Fe)

306-M. **The Structure of Electrodeposits.** J. J. Dale. *Metal Finishing,* v. 52, July 1954, p. 52-56, 59.

Defects, growth of deposits, effect of plating conditions on grain size. Micrographs. (To be continued.) (M27, L17)

307-M. **Possible Macroscopic Effects of Single Lattice Defects.** Jerome Rothstein. *Physical Review,* v. 95, ser. 2, July 15, 1954, p. 370-371.

Physical properties of crystals which are strongly anisotropic in the layered crystal may approach isotropicity in presence of spiral dislocations as intra-plane parameters can dominate interplane propagation. Table. 8 ref. (M26, M28)

308-M. (French.) **Influence of Impurity Distribution on Micrographic Behavior of Grain Boundaries and Subboundaries After Heat Treatment in Two Cases of Refined Aluminum.** Gérard Wyon and Jean-Mary Marchin. *Comptes rendus,* v. 238, no. 25, June 21, 1954, p. 2420-2422.

Test sheets were homogenized at 640° C. for 20 days and aged at temperatures between 250 and 600° C. for 20 hr. Micrographs. 3 ref. (M27, Al)

309-M. (Russian.) **X-Ray Investigation of Tin-Selenium, Zinc-Selenium, Cadmium-Selenium, and Silver-Selenium Alloys.** L. S. Palatnik and V. V. Levitin. *Doklady Akademii Nauk SSSR,* v. 96, no. 5, June 11, 1954, p. 975-978.

X-ray diffraction studies of vapor-deposited films after various annealing treatments. Table. 6 ref. (M22, J23, Sn, Zn, Ag, Cd, Se)

310-M. (German.) **The Structure of the Copper-Lead-Oxygen System.** Erich Gebhardt and Walter Obrowski. *Zeitschrift für Metallkunde,* v. 45, no. 6, June 1954, p. 332-338.

Results of thermal, microscopic, chemical and X-ray studies. Phase diagrams, micrographs, tables. 12 ref. (M24, Cu, Pb)

311-M. (German.) **The Copper-Lead-Oxygen System.** Wilhelm Hofmann and Jürg Kohlmeyer. *Zeitschrift für Metallkunde,* v. 45, no. 6, June 1954, p. 339-341.

Thermal and metallographic studies to establish equilibria points. Graphs, micrographs. 3 ref. (M24, Cu, Pb)

312-M. (German.) **Research on the Copper-Antimony System.** Konrad Schubert and Martin Ilschner. *Zeitschrift für Metallkunde,* v. 45, no. 6, June 1954, p. 366-370.

X-ray, dilatometric and metallographic studies of phases present. Tables, graphs, micrographs. 20 ref. (M24, Cu, Sb)

313-M. (German.) **Investigations of the Copper-Tellurium System.** Kurt

Anderko and Konrad Schubert. *Zeitschrift für Metallkunde,* v. 45, no. 6, June 1954, p. 371-378.

X-ray, dilatometric and metallographic studies of phase boundaries. Graphs, tables, diagrams, micrographs. 17 ref. (M24, Cu, Te)

314-M. (Russian.) **Silver-Chromium Alloys.** A. T. Grigor'ev, E. M. Sokolovskaia and M. I. Kruglova. *Moscow Universiteta, Vestnik, Seriia Fiziko-Matematicheskikh i Estestvennykh Nauk,* v. 9, no. 5, May 1954, p. 77-81.

Thermal analyses, structure, mutual solubilities. Table, photographs, phase diagrams. (M24, Ag, Cr)

315-M. (Book.) **Microscopical Techniques in Metallurgy.** Henry Thompon. 160 p. Pitman Publishing Corp., 2 W. 45th St., New York 19, N. Y. $2.75.

Sampling and preparation of specimens. Describes the cheif features of the metallurgical microscope, reproduction of structure by photography and the use of color photography. Methods for determining graphite flake size and type in cast iron, inclusion ratings in steel and grain size. (M21)

316-M. (Book.) **The Structure of Metals and Alloys.** William Hume-Rothery and G. V. Raynor. 3rd Ed. 363 p. 1954. The Institute of Metals, 4 Grosvenor Garden, London S.W.-1, England. 35s.

Lattice parameters and interatomic distances in crystals. Structure of alloys of iron. Imperfections in crystals. (M26, Fe)

317-M. (Book.) **X-Ray Diffraction Procedures.** Harold P. Klug and Leroy E. Alexander. 716 p. 1954. John Wiley & Sons Inc., 440 Fourth Ave., New York 16, N. Y. $15.00.

Elementary crystallography, production and properties of X-rays, techniques and applications in research. (M22)

318-M. An Fe-Cr-Mo-Ni Sigma Phase. A. G. Allten. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 904-905.

Metallographic and X-ray diffraction examination verifies existence of sigma phase. Tables, diffraction pattern. 3 ref. (M26)

319-M. Locations and Sizes of Interstitial Holes in the Alpha-Uranium Lattice. A. J. Opinsky. *Journal of Metals,* v. 6, Aug. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 913-914.

Theoretical and mathematical approach in orthorhombic uranium lattice, based on a hard-sphere model. Photographs, tables. 1 ref. (M26, U)

320-M. Columbium-Vanadium Alloy System. H. A. Wilhelm, O. N. Carlson and J. M. Dickinson. *Journal of Metals,* Aug. 1954, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 915-918.

Proposed phase diagram based on microscopic studies, melting points and X-ray analyses. Micrographs, table, graphs. 7 ref. (M24, Cb, V)

321-M. Thermodynamic Data for the Zinc-Indium System Obtained From the Phase Diagram. W. J. Svirbely. *Journal of Physical Chemistry,* v. 58, July 1954, p. 557-559.

Solubility data at 700° K. Graphs. 9 ref. (M24, Zn, In)

322-M. A Method for the Electrolytic Etching of Aluminium for Microscopic Examination. P. A. Raine, H. J. Ellis, and L. W. Terry. *Metallurgia,* v. 50, no. 297, July 1954, p. 45-46, 52.

Experimental details for improved method for development and control of structure of extruded aluminum tube. Micrographs, diagram, photograph. 1 ref. (M21, Al)

323-M. High-Resolution Autoradiography. George C. Towe, Henry J. Gomberg and J. W. Freeman. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3209, July 1954, 138 p.

Adaptation of high-resolution wet-process autoradiographic method to the study of metal structures. Graphs, autoradiographs, micrographs, diagrams, tables. 101 ref. (M23)

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Effects of nonmetallic inclusions on graphitization and stability of carbides. Diagram, table, graphs, micrographs. (M26, CI)

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Comparison of classic and Brillouin analyses. (M22)

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Planimetric, counting, comparison and stereoradiographic methods. Diagrams, micrographs, tables, graphs. 20 ref. (M27, M23, ST)

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Structures at temperatures from 20 to 290° K. for tin and copper-tin alloys. Diagrams, X-ray patterns, graphs. 8 ref. (M26, L25, Sn, Cu)

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Structures of tin, tin-copper, tin-gallium and tin-bismuth films. Diagram, graphs, diffraction patterns. 20 ref. (M22, Sn, Cu, Ga, Bi)

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333-M. The Structure of Electrodeposits. II. J. J. Dale. *Metal Finishing,* v. 52, Aug. 1954, p. 67-72.

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Determination of nuclear constants and investigations of structure of solids. Table, diagrams, graphs. 25 ref. (M22)

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Interpretation of structure, stability and electrical properties of metallic borides. Diagrams, tables, graphs. 10 ref. (M25, M26, P15, B)

338-M. The Metallographic View. I. Annealed Carbon Steels. Howard E. Boyer. *Steel Processing,* v. 40, Aug. 1954, p. 505, 526.

Appearance and significance of typical microstructures. Micrographs, graph. (M27, CN)

339-M. Alloys of Titanium With Copper, Silver, and Gold. E. Raub, P. Walter and M. Engel. *Henry Brutcher, Altadena, Calif., Translation no.* 3017, 16 p. (From *Zeitschrift für Metallkunde,* v. 43, no. 4, 1952, p. 112-118.)

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340-M. Preparation of Metallographic Sections and Development of Microstructure of Cemented Carbides. I. N. Chaporova. *Henry Brutcher,*

Altadena, Calif., Translation no. 3061, 12 p. (From *Zavodskaya Laboratoriya,* v. 15, no. 7, 1949, p. 799-805.)

Compositions and evaluation of various etchants. Table, micrographs. (M21, M27, C-n)

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342-M. A New Method for Polishing and Etching of Metallographic Specimens of Tungsten and Molybdenum Metal. T. Millner and L. Sass. *Henry Brutcher, Altadena, Calif., Translation no.* 3281, 5 p. (From *Aluminium (Budapest),* v. 5, no. 10, Oct. 1953, p. 214-215.)

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(M21, W, Mo)

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Previously abstracted from original. See item 215-M, 1954.
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Problems arising in the quantitative autoradiographic study of dendritic segregation in steels. Description of microphotometer. Experimental results obtained in the course of the homogenization of phosphorus segregation. Diagrams, autoradiograph, photograph, table, graphs. 4 ref. (M23, ST)

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Experimental study on vapor deposited nickel, silver and gold films to explain anomalous lines occasionally observed on electron-diffraction pictures. Diagrams, tables. 21 ref. (M22, L25, Ni, Ag, Au)

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Determination of constitution diagram, phase structures and lattice constants by micrographic and X-ray sudies at normal and elevated temperatures. Constitution diagram, micrographs, tables, graphs. 9 ref. (M24, M26, Mn, Pd)

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388-M. (Russian.) **X-Ray Investigation of Nitrided Layer of Carbon and Alloy Steels.** M. I. Fuks and E. V. Aronson. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 8, Aug. 1954, p. 1448-1454.
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Design and construction of a Geiger-Müller X-ray spectrometer suitable for the study of transitions in single crystals. Photographs, diagrams, circuits, graph. 12 ref. (M23, M26)

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Effect of stress and specimen texture on diffraction pattern. Diagrams, graphs, tables. 13 ref. (M22, L25, Cu)

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Structures determined by chemical and X-ray methods. Tables. 9 ref. (M26, M27, W)

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W. H. Taylor. *Acta Metallurgica,* v. 2, no. 5, Sept. 1954, p. 684-695.

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394-M. (English.) **Relaxation Effects in Solid Solutions Arising From Changes in Local Order. I. Experimental.** B. G. Childs and A. D. Le Claire. *Acta Metallurgica,* v. 2, no. 5, Sept. 1954, p. 718-726.

Short-range ordering in relation to internal friction and relaxation properties of copper-zinc, copper-aluminum and platinum-nickel solid solution alloys. Graphs, tables. 12 ref. (M26, Q22, Cu, Zn, Al, Pt, Ni)

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Investigations with a counting tube goniometer. Characteristics of differences and their interpretation. Diagrams, tables, micrographs. 7 ref. (M23, Fe, C)

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Metallographic and chemical investigation of phase structure of cast alloys indicates a eutectic surface regardless of tin concentration and cooling rate. Micrographs, table, graph, diagram. 5 ref. (M24, Pb, Sn)

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Improved techniques for polishing of ferrous, aluminum, magnesium and copper alloys. Micrographs. 12 ref. (M21, Fe, Al, Mg, Cu)

400-M. (French.) **Orientation of Crystals in Rolled Uranium.** A. Winogradski. *Revue de métallurgie,* v. 51, no. 9, Sept. 1954, p. 597-601; disc., p. 601-602.

X-ray study of very thin sheets. Pole figures, graph, micrograph. 3 ref. (M26, U)

401-M. (French.) **A Metallographic Study of Uranium Hydride Inclusions in Metallic Uranium.** H. Mogard and G. Cabane. *Revue de métallurgie,* v. 51, no. 9, Sept. 1954, p. 617-622.

Data for uranium-hydrogen equilibria obtained by studying inclusions produced by heating specimens in a high hydrogen pressure. Micrographs, graphs. 13 ref. (M27, U)

402-M. (Italian.) **Research With the Electron Microscope on the Structure of Copper Electrodeposited From a Solution of Fluoborate.** G. Bianchi. *Metallurgia italiana,* v. 46, nos. 7-8, July-Aug. 1954, p. 251-256.

Effects of current density on crystalline shapes. Diagram, micrographs. 7 ref. (M27, M26)

403-M. (Polish.) **Structures of Chilled Iron Rolls.** J. Jastrzebska and W. Haczewski. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 4, 1954, p. 157-169.

Optimum microstructures established for core and chilled layers for working conditions prevailing in Polish and German rolling practice. Tables, micrographs, graphs, diagram. 14 ref. (M27, CI)

404-M. A High-Resolution Evaporated-Carbon Replica Technique for the Electron Microscope. D. E. Bradley. *Institute of Metals, Journal,* v. 83, Sept. 1954, p. 35-38 + 2 plates.

Two-stage replica technique using an intermediate Formvar film. Resolution is better than 50 A. Diagrams, micrographs. 9 ref. (M21)

405-M. The Lattice Spacings of Binary Tin-Rich Alloys. J. A. Lee and G. V. Raynor. *Physical Society, Proceedings,* v. 67, no. 418B, Oct. 1954, p. 737-747.

Variation of structures with composition of solid solutions in tin of antimony, bismuth, lead, indium, cadmium, zinc and mercury. Graphs, tables, diagrams. 12 ref. (M26, Sn, Sb, Bi, Pb, In, Cd, Zn, Hg)

406-M. Apparatus for X-Ray Diffraction Studies of Metals Under Controlled Stress at Elevated Temperature. L. S. Birks. *Review of Scientific Instruments,* v. 25, Oct. 1954, p. 963-966.

Geiger-counter X-ray spectrometer. Construction details. Photographs, diagrams. 6 ref. (M22)

407-M. Contribution to the System Molybdenum-Silicon. R. Kieffer and E. Cerwenka. *Henry Brutcher, Altadena, Calif., Translation no.* 2960, 12 p. (From *Zeitschrift für Metallkunde,* v. 43, no. 4, 1952, p. 101-105.)

Previously abstracted from original. See item 254-M, 1952. (M24, Mo, Si)

408-M. The Structure of Titanium-Copper and Titanium-Tungsten Alloys. W. Trzebiatowski, J. Berak, J. Niemiec and T. Romotowski. *Henry Brutcher, Altadena, Calif., Translation no.* 2990, 2 p. (From *Roczniki Chemii,* v. 25, no. 4, 1951, p. 516-517.)

Results of an investigation based on microscopic and X-ray studies. 4 ref. (M26 M27 Ti, Cu, W)

409-M. Structure and Homogeneity Boundaries of Tantalum Carbide. V. I. Smirnova and B. F. Ormont. *Henry Brutcher, Altadena, Calif., Translation no.* 3376, 9 p. (From *Doklady Akademii Nauk SSSR,* v. 94, no. 3, 1954, p. 557-560.)

Previously abstracted from original. See item 304-M, 1954. (M26, M27, Ta)

410-M. (French.) **Structure of Ingot Molds in Steel Plants.** Michel Ferry. *Fonderie,* 1954, no. 103, Aug., p. 4070-4077.

Study of variation of quantities of pearlite and ferrite in cast iron molds at various locations in the mold. Micrographs, tables, drawings. (M27, CI)

411-M. (Book.) **Structure Reports for 1950.** A. J. C. Wilson, editor. v. 13. 644 p. 1954. NV.A. Oosthoek's Uitgevers MIJ. Utrecht, Holland. 80 Dutch florins.

Published for the International Union of Crytallography. Sections include metals, inorganic and organic compounds. (M26)

412-M Imperfections in Matter. G. W. Rathenau. *Philips Technical Review,* v. 15, Oct. 1953, p. 105-113.

Phenomena inherent in idealized solids and others which are due to disturbances or imperfections in the system. Micrographs, graphs. 27 ref. (M27)

SECTION N

TRANSFORMATIONS and RESULTING STRUCTURES

1-N. (French.) **Hydrogen in Pig Iron and Steel.** Paul Bastien. *Fonderie,* 1953, Sept., no. 92, p. 3579-3598.

Solubility of hydrogen in liquid iron and phenomena accompanying solidification. Analytical methods of determining hydrogen in steels and results obtained. Effect of hydrogen on pig iron crystallization, formation of air holes, graphitization and plastic deformation. Tables, graphs, diagrams, photographs. 55 ref. (N12, Q24, Fe, ST)

2-N. (French.) **The Growth of Metal Grains.** Paul Lacombe. *Metaux, Corrosion-Industries,* v. 28, no. 338, Oct. 1953, p. 377-391.

Literature review. Attempts to clarify conceptions and confusion in terminology, especially with respect to primary recrystallization and continued and discontinued growth. Micrographs. 35 ref. (N3, N5, Al, Zn)

3-N. Diffusion and Solubility of Boron in Iron and Steel. Paul E. Busby, Mary E. Warga and Cyril Wells. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1463-1468.

Reports diffusion rate of boron about same as carbon in austenite. Solubility at normal heat treating temperatures is less than 0.001%. Tables, graphs, diagrams. 22 ref. (N1, B, Fe, ST)

4-N. On the Theory of the Formation of Martensite. M. S. Wechsler, D. S. Lieberman and T. A. Read. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1503-1515.

A theoretical analysis of austenite-martensite transformation which predicts habit plane, orientation relationships and macroscopic distortions from a knowledge only of crystal structures of initial and final phases. Diagrams, tables. 21 ref. (N9, ST)

5-N. Diffusionless Phase Change in the Indium-Thallium System. M. W. Burkart and T. A. Read. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1516-1524.

Crystal geometry of cubic-tetragonal interface after partial transformation of an indium-thallium alloy single crystal. General theory. Effects of applied stress interpreted. Diagrams, photographs, graphs. 15 ref. (N6, In, Tl)

6-N. Effects of Sample Surface and X-Ray Diffraction Camera Geometry on the Determination of Retained Austenite in Hardened Steels. Karl E. Beu and Donald P. Koistinen. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1529-1530.

Experiments to determine effect of irregular surfaces on reliability of austenite determinations. Diagram, table. 7 ref. (N8, AY)

7-N. Calculation of Interdiffusion Coefficients When Volume Changes Occur. Morris Cohen, Carl Wagner and J. E. Reynolds. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1534-1536.

Suggests modifications necessary in order for diffusion equation to retain its usual form. 9 ref. (N1)

8-N. Notes on the Determination of Retained Austenite by X-Ray Methods. Karl E. Beu. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1539-1540.

Factors affecting reliability of the determination. Diagram. 4 ref. (N8, M22, AY)

9-N. Theory of Plasma Waves in Metals. Peter A. Wolff. *Physical Re-*

view, v. 92, ser. 2, Oct. 1, 1953, p. 18-23.

The effect of the crystal lattice on plasma oscillations was investigated by the Hartree approximation. Earlier works are reviewed. 14 ref. (N10, Cu, Ni, Ag, Be, Al)

10-N. (French.) **Electron Microscopic Observations of the Effect of Recrystallization on the Substructure of Copper.** Laurence Delisle. *Revue de métallurgie,* v. 50, no. 10, Oct. 1953, p. 665-682.

Relationship between the substructures and mechanical and thermal treatment of the metal. Experimental details. Tables, micrographs. 22 ref. (N5, M21, Cu)

11-N. **A Study of the Propagation Mode for Metallic Vapors in Shadow-Casting by Vacuum Evaporation of Au^{198} and Cr^{51}.** L. E. Preuss. *Journal of Applied Physics,* v. 11, Nov. 1953, p. 1401-1409.

Special method introduced for quantitatively determining metal-evaporation mechanism using metallic Au and Cr, tagged with pile-produced Au^{198} and Cr^{51}. Graphs, tables, photographs. (N15, S19, Au, Cr)

12-N. **Diffusion of Calcium Ion in Liquid Slag.** Helen Towers, Michel Paris and John Chipman. *Journal of Metals,* v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, Nov. 1953, p. 1455-1458.

A simple radioactive tracer technique used to measure diffusion coefficient of calcium ion in molten slags. Diagram, graphs, photograph. 8 ref. (N1, B21, S19)

13-N. **Production of Oriented Single-Crystal Silicon Iron Sheet.** C. G. Dunn and G. C. Nonken. *Metal Progress,* v. 64, Dec., 1953, p. 71-75. ✓

Equipment and techniques. Photographs, diagrams. (N5, Fe)

14-N. (Russian.) **Local Distortions of the Crystalline Lattice During Phase Hardening.** L. Moroz and T. Mingin. *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 249-251.

Concludes that a considerably smaller quantity of atoms which were not coherent were formed as a result of static distortions of the lattice than in the case of plastic deformation. Tables. 9 ref. (N6, M26, Fe)

15-N. (Russian.) **Influence of Pressure on the Eutectoid Dissociation in Copper-Aluminum Alloy.** M. I. Zakharova. *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 287-289.

Copper alloys containing 12.5% aluminum prepared from electrolytic metals were used. Application of pressure in the quenching process after annealing increases the temperature of the start and completion of eutectoid dissociation. 4 ref. (N9, Cu, Al)

16-N. (Russian.) **Effect of Cobalt on Carbon Diffusion in Iron-Carbon Alloys.** V. A. Iurkov and M. A. Krishtal. *Doklady Akademii Nauk SSSR,* v. 92, no. 6, Oct. 21, 1953, p. 1171-1173.

Experimental results of diffusion process in cast iron alloyed with cobalt. Graphs. 6 ref. (N1, Fe, Co)

17-N. **Production of Single Crystals of Nickel.** R. F. Pearson. *British Journal of Applied Physics,* v. 4, Nov. 1953, p. 342-344.

Detailed account. Preparation of faces parallel to desired crystal planes. Diagrams, photograph. 3 ref. (N12, M26, Ni)

18-N. **The Distribution of Solute in Crystals Grown From the Melt. I. Theoretical.** J. A. Burton, R. C. Prim and W. P. Slichter. **II. Experimental.** J. A. Burton, E. D. Kolb, W. P. Slichter and J. D. Struthers. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 1987-1996.

Incorporation of solute elements into single crystals of germanium grown from the melt. Variation of distribution coefficient with conditions of crystallization. Graphs, diagrams, tables. 24 ref. (N12, Ge)

19-N. **Segregation of Impurities During the Growth of Germanium and Silicon Crystals.** R. N. Hall. *Journal of Physical Chemistry,* v. 57, Nov. 1953, p. 836-839; disc., p. 839.

Segregation of impurities found to depend upon growth rate and crystal orientation as well as upon degree of stirring in the melt. Graphs. 8 ref. (N12, Ge, Si)

20-N. (French.) **Textures of Secondary Recrystallization in Mild Iron.** Roger Guihaumé, Micheline Sternberg and Paul Lacombe. *Comptes rendus,* v. 237, no. 16, Oct. 19, 1953, p. 904-906.

Details of investigations, crystal orientation, and differences in a large number of specimens. 4 ref. (N5, Fe)

21-N. (French.) **Orientation of Gamma-Alumina on the Surface of Melted Aluminum.** Shigueo Oketani and Sigemaro Nagakura. *Métaux, Corrosion-Industries,* v. 28, no. 339, Nov. 1953, p. 435-436.

Includes tables and graphs. 3 ref. (N12, M26, Al)

22-N. (French.) **Production of Recrystallization Textures.** P. Coheur. *Métaux, Corrosion-Industries,* v. 28, no. 339, Nov. 1953, p. 423-434.

Properties of the metals, factors depending on the laminating and factors characterizing the annealing. Diagrams, radiograms, tables. 19 ref. (N5, J23)

23-N. (German.) **The Cooling Curve of Cast Iron With Spherical Graphite.** Adalbert Wittmoser. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct. 1953, p. 431-434.

Investigates discrepancies in cooling curves by different authors. Experiments reveal that disagreement was due to differences in graphite composition. Tables, graphs, photographs, diagrams. 15 ref. (N8, J general, CI)

24-N. (German.) **Transposition Reactions in the Iron-Silicon System.** Erich Fitzer. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 462-472.

Solid reactions occurring when phases are in contact which do not correspond to thermal equilibrium state. Diffusion of silicon in the alpha solid solution. Concentration dependence of diffusion coefficient and stratification in Fe-FeSi and Fe-Si arrangements. Theoretical findings applied to practical cases. Diagrams, micrographs, graphs, table, photographs. 26 ref. (N1, Fe, Si)

25-N. (Russian.) **Displacement of Grain Boundaries of Heated Metal.** I. A. Oding, M. G. Lozinskii and S. G. Fedotov. *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 75-77 + 1 plate.

Grain boundary of N-12 steel was displaced with an average linear velocity of 0.10 to 0.16 mm. per hr. Tin-bronze velocity was 0.30 to 0.40 mm. per hr. Micrographs. 12 ref. (N3, AY, Sn, Cu)

26-N. (Russian.) **Diffusion of Iron Into Nickel.** M. B. Neiman, A. Ia. Shiniaev, and B. G. Dzantiev. *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 265-267.

Studies made by following a new variant of tracer technique for determining diffusion in solid bodies. Graphs, table. 7 ref. (N1, Fe, Ni)

27-N. (Russian.) **Precipitation of Nickel Tantalide Ni_3Ta From Alloys of the Nickel-Tantalum Binary System.** I. I. Kornilov and E. N. Pylaeva. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 841-843 + 1 plate.

Nickel tantalide phase found to have a hexagonal lattice. Methods of study. Micrographs. (N9, M24, Ni, Ta)

28-N. (French.) **The Isothermal Transformation of Austenite and the Distribution of Alloying Elements in Low-Alloy Steel.** Axel Hultgren. *Revue de métallurgie,* v. 50, no. 11, Nov. 1953, p. 737-760.

Various types of transformations have been distinguished and their kinetics determined from time-temperature-transformation diagrams, micro-examination of the transformation products and diffraction study and chemical analysis of carbides separated by electrolytic means. Tables, graphs, micrographs. (To be continued.) (N8, AY)

29-N. (Russian.) **Structure of Austenite at High Temperatures.** I. A. Oding and M. G. Lozinskii. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 7, July, p. 1035-1043.

Appearance of plane blocks in austenite grains and increased chemical heterogeneity occurring after heating to high temperatures. Diagrams, micrograph. 9 ref. (N8)

30-N. **Causes of the Effect of Small Dissolved Admixtures on the Kinetics of the Aging of Alloys.** V. I. Arkharov, B. N. Varskoi and N. N. Skornyakov. *National Science Foundation Translation,* no. 45, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 1003.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Observations on strong accelerating effect of antimony on aging of many silver and copper alloys. Table, graphs. 6 ref. (N7, Ag, Cu, Sb)

31-N. **Displacement of Grain Boundaries in Annealed Metal.** I. A. Oding, M. G. Lozinsky and S. G. Fedotov. *National Science Foundation Translation,* no. 73, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 75-77.) Available from the Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 25-N, 1954. (N3, AY, Sn, Cu)

32-N. **On the Effect of Certain Dissolved Admixtures on the Frontal Diffusion of Silver Into Polycrystalline Copper.** V. I. Arkharov, S. I. Ivanovskaya and N. N. Skornyakov. *National Science Founation Translation,* no. 58, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, no. 4, Apr. 1953, p. 669-672.) Available from the Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 317-N, 1953.
(N1, Cr, Ag)

33-N. On the Thermodynamics of Simple Carbides in Steel. N. S. Fastov and B. N. Finkel'shtein. *National Science Foundation Translation,* no. 77, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, no. 4, Apr. 1953, p. 677-679.) Available from Office of Techndical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 318-N, 1953.
(N8, M27, ST)

34-N. Frontal Diffusion in Iron of Commercial Purity. V. I. Arkharov, K. A. Yefremova, S. I. Ivanovskaya, A. K. Shtolts and B. A. Yunikov. *National Science Foundation Translation,* no. 48, Aug. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 269.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Studies of diffusion of several elements into iron. Different shapes of the diffusion front observed. Micrographs. 6 ref. (N1, Fe)

35-N. A Method for Determining Diffusion Coefficients. S. N. Kryukov and A. A. Zhukovitsky. *National Science Foundation Translation,* no. 71, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 379-382.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Proposes a radioactive tracer technique for determining diffusion coefficients. Graphs. 4 ref. (N1, Ag)

36-N. Phase Changes During Electrospark Treatment of Metals and an Attempt to Establish Criteria for the Observed Interactions. L. S. Palatnik. *National Science Foundation Translation,* no. 53, Aug. 1953, 4 p. (Original in *Doklay Akademii Nauk SSSR,* v. 89, 1953, p. 455-458.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Structural changes in surface layer of various metals subjected to electrospark treatment in air for about 100 combinations of unlike electrodes. Tables, graph. 6 ref.
(N6, Mg, Fe, Al, Ni, Cu, Zn, Cd, Sn, Pb)

37-N. The Temperature and Composition of the Beta-Alpha+Gamma$_2$ Eutectoid Reaction in Copper-Aluminium Alloys. D. L. Thomas and D. R. F. West. *Research (Supplement),* v. 6, Dec. 1953, p. 61S-62S.

Includes table. 5 ref. (N9, Cu, Al)

38-N. X-Ray Analysis of the Aging of Al-Zn Alloys. A. M. Yelistratov. *National Science Foundation Translation,* no. 65, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 803-806.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

A pure aluminum-zinc alloy, 25% zinc by weight, was studied. Samples were wires 0.1 to 0.5 mm. in diameter. They were quenched in ice water after heating at 44° C. for 2 hr. Grain sizes ranged from 0.1 to 0.02 mm. Micrographs. 6 ref.
(N7, Al, Zn)

39-N. X-Ray Analysis of the Initial Stages of Aging of Beryllium Bronze. A. M. Yelistratov, S. D. Finkel'shtein, and T. Yu. Goldshtein. *National Science Foundation Translation,* no. 63, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 669-672.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Results of study of structural changes. Refers only to initial stages of aging before the alloy has reached maximum hardness and before lattice constant of the alpha phase has changed. Micrographs. 8 ref. (N7, Be, Cu)

40-N. Mobility of Impurity Ions in Germanium and Silicon. J. C. Severiens and C. S. Fuller. *Physical Review,* v. 92, ser. 2, Dec. 1, 1953, p. 1322-1323.

Mobilities of lithium and copper investigated to secure information on their state of ionization and their diffusivities in germanium and silicon. Graph. 4 ref. (N1, Li, Cu)

41-N. (Russian.) **Nature of Martensite.** B. A. Apaev. *Doklady Akademii Nauk SSSR,* v. 93, no. 4, Dec. 1, 1953, p. 647-649.

Magnetic method used to show that electrolytic precipitate of a hardened specimen is not martensitic carbide but a finely dispersed martensite powder. Graphs. 3 ref.
(N8, ST)

42-N. Isothermal Transformations in Cast Iron. J. Ings. *Australasian Engineer,* 1953, Nov., p. 62-67.

Problems in producing high-quality cast iron. Photographs, graphs. 10 ref. (N8, CI)

43-N. The Reaction of Nitrogen With, and the Diffusion of Nitrogen in, Beta Zirconium. M. W. Mallett, Jack Belle and B. B. Cleland. *Electro-*

chemical Society, Journal, v. 101, Jan. 1954, p. 1-5.

Rate of reaction of nitrogen with high-purity zirconium determined for temperature range of 975 to 1640° C. at 1 atmosphere pressure. Graphs, tables. 18 ref. (N1)

44-N. The Reaction of Silver Alloys With Sulfur in Mineral Oil. II. Examination of Reaction Films and Mechanism of Reaction. H. O. Spauschus, R. W. Hardt and R. T. Foley. *Electrochemical Society, Journal,* v. 101, Jan. 1954, p. 6-9.

Spectroscopic examination of films showed that sulfide films grown on silver alloys of cadmium, antimony, indium, thallium and zinc contained an appreciable quantity of the alloying element. Films grown on aluminum, magnesium and manganese alloys contained only a trace of the alloying element. Tables. 4 ref. (N12, S11, Ag)

45-N. The Copper-Silicon Eutectoid Transformation. A. D. Hopkins. *Institute of Metals, Journal,* v. 82, Dec. 1953, p. 163-165.

Hardness and metallographic studies made of the eutectoid transformation in a copper 5% with silicon alloy over the range 275-500° C. Graphs. 11 ref. (N9, Cu, Si)

46-N. Precipitation Processes in Copper-Iron Alloys. J. Reekie, T. S. Hutchison and F. E. Hetherington. *Physical Society, Proceedings,* v. 66, no. 408B, Dec. 1953, p. 1101-1112.

At high degrees of cold working dislocations are probably predominant factor in increasing resistance. Graphs, diagrams. 16 ref. (N7, Q24, Cu, Fe)

47-N. Gases in Metals. C. R. Cupp. Paper from "Progress in Metal Physics." v. IV. Interscience Publishers, Inc., p. 105-173 + 1 plate.

Solution and diffusion of gases in solid metals, with absorption, retention and evolution of gases by metals and with effects upon the properties of the solid metals. Tables, graphs, diagrams. 247 ref. (N1, Q general)

48-N. Diffusion in Metals. A. D. Le Claire. Paper from "Progress in Metal Physics." v. IV. Interscience Publishers, Inc., p. 265-332.

More important advances that have been made in understanding of diffusion processes. Diagrams, tables, graphs. 131 ref. (N1)

49-N. Nucleation. J. H. Hollomon and D. Turnbull. Paper from "Progress in Metal Physics." v. IV. Interscience Publishers, Inc., p. 333-388.

Nucleation in general with particular emphasis on rate of nucleation in reactions involving crystalline phases. Graphs, tables, diagrams. 92 ref. (N2)

50-N. Incubation Time of Austenite Transformation With Different Types of Cooling. F. Wever and O. Krisement. Henry Brutcher, Altadena, Cal., Translation no. 3039, 30 p. + 1 plate. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 5-6, 1952, p. 229-237.)

Previously abstracted from original. See item 217-N, 1952. (N8, ST)

51-N. Effect of Foreign Nuclei Upon Crystallization of Metals and Alloys, Particularly the Formation of Eutectic in Gray Iron. VII. Nucleation and Growth of Spheroidal Graphite. W. Patterson. Henry Brutcher, Altadena, Cal., Translation no. 3091, 14 p. + 1 plate. (From *Giesserei, Technisch-Wissenschaftliche Beihefte,* 1952, nos. 6-8, p. 375-378.)

Lattice relationships between graphite and foreign nuclei present in cast iron as governing formation of spheroidal or flake graphite. Graphs, diagrams, micrographs. 3 ref. (N12, CI)

52-N. On Diffusion Fronts in Technical Iron. V. I. Arkharov, et al. Henry Brutcher, Altadena, Cal., Translation no. 3099, 6 p. + 1 plate. (From *Doklady Akademii Nauk SSSR,* v. 89, no. 2, 1953, p. 269-270.)

Shape of diffusion front in case of impregnation of technical iron with chromium and aluminum as against nickel, copper and palladium. Micrographs. 6 ref. (N1, Fe, Cr, Al, Ni, Cu, Pd)

53-N. Phase and Structural Transformations in Steel After Repeated Recrystallization. D. S. Kazarnovskii. Henry Brutcher, Altadena, Cal., Translation no. 3101, 9 p. + 1 plate. (From *Doklady Akademii Nauk SSSR,* v. 87, new ser., no. 3, Nov. 21, 1952, p. 409-413.)

Previously abstracted from original. See item 207-N, 1953. (N5, M27, C, CN)

54-N. Reactions Between Solid Iron and Liquid Aluminum and Aluminum Alloys. E. Gebhardt and W. Obrowski. Henry Brutcher, Altadena, Cal., Translation no. 3149, 19 p. + 1 plate. (From *Zeitschrift für Metallkunde,* v. 44, no. 4, Apr. 1953, p. 154-160.)

Previously abstracted from original. See item 170-N, 1953. (N12, Fe, Al)

55-N. (German.) **Vaporization of Metals and Metalloids in Vacuum.** H. Laporte. *Chemische Technik,* v. 5, no. 11, Nov. 1953, p. 632-634.

General principles and rules for

industrial vacuum vaporization. Small laboratory vacuum vaporization plant described. Tables. 4 ref. (N16, L25)

56-N. (German.) **The Course of Segregation of Copper-Beryllium at High Temperature.** W. Gruhl. *Metall,* v. 7, nos. 23-24, Dec. 1953, p. 978-982.

Resistance measurements, X-ray studies and metallographic investigations of segregation of beryllium from supersaturated solid copper-beryllium solutions at 500-750° C. Graphs, X-ray diagrams, tables, photomicrographs. 14 ref. (N12, Cu, Be)

57-N. (German.) **Research on the Solubility of Titanium in Magnesium.** H. Eisenreich. *Metall,* v. 7, nos. 23-24, Dec. 1953, p. 1003-1006.

Experiments of dissolving titanium in magnesium by adding titanium tetrachloride to the melt and of casting into sand and chill molds. Graphs, tables, photomicrographs. 5 ref. (N12, Ti, Mg)

58-N. (Russian.) **Determining the Bonding Energy in the Austenite Lattice.** Iu. V. Kornev. *Doklady Akademii Nauk SSSR,* v. 93, no. 3, Nov. 21, 1953, p. 467-470.

Conclusion that addition of carbon to iron noticeably decreases energy of the bond of the austenite lattice. Table, diagram, graph. 8 ref. (N8, Fe)

59-N. **Diffusion of Nitrogen in Iron.** J. D. Fast and M. B. Verrijp. *Iron and Steel Institute, Journal,* v. 176, Jan. 1954, p. 24-27.

Determination of the diffusion coefficient of nitrogen at 950° C. shows that diffusion in gamma-iron is much slower than in alpha-iron. Graphs, tables. 16 ref. (N1, Fe)

60-N. **Magnetic Transformation of Iron in Copper Matrix at Low Temperatures.** R. E. Cech and D. Turnbull. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Jan. 1954, p. 45-46.

Phenomenon initiated by subcooling below room temperature. Table. 5 ref. (N6, Fe, Cu)

61-N. **Solidification of Aluminum-Rich Aluminum-Copper Alloys.** Arthur B. Michael and Michael B. Bever. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Jan. 1954, p. 47-56.

Investigation of different solidification rates. Graphs, tables, micrographs. 21 ref. (N12, Al, Cu)

62-N. **Reaction of Oxygen and Nitrogen With Titanium From 700° to 1050° C.** Lee S. Richardson and Nicholas J. Grant. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Jan. 1954, p. 69-70.

Experimental results of studies in reaction rates. Graphs. 5 ref. (N general, Ti)

63-N. **An Application of the Absolute Rate Theory to Phase Changes in Solids.** F. W. Cagle, Jr., and Henry Eyring. *Journal of Physical Chemistry,* v. 57, Dec. 1953, p. 942-946.

Theoretical analysis. Results are applied to white to gray transition in tin. Graphs. 2 ref. (N6, Sn)

64-N. **A Thermal Gradient Method for the Study of Crystal Structure and Its Application to Order-Disorder Research.** John B. Newkirk. *Review of Scientific Instruments,* v. 24, Dec. 1953, p. 1116-1121.

New method has been developed for studying effect of temperature on crystal structure of metals and alloys. Micrographs, diagrams, photograph. (N10, M26)

65-N. **Transformation of Cr-Mo Steels During Welding.** W. R. Apblett, Jr., R. P. Dunphy and W. S. Pellini. *Welding Journal,* v. 33, Jan. 1954, p. 57S-64S.

Experimental procedures and results using two chromium-molybdenum steels. Table, diagrams, graphs, micrographs. (N8, K general, AY)

66-N. (English.) **The Isothermal Transformation of Metastable Beta-Uranium Single Crystals.** A. N. Holden. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 617-623.

Individual uranium martensite plates formed and grew at a slow rate isothermally. Diagrams, micrographs. 8 ref. (N6, U)

67-N. (English.) **The Influence of Oxygen Contents on Transformations in a Titanium Alloy Containing 11 Per Cent Molybdenum.** D. J. Delazaro and W. Rostoker. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 674-678.

Presence of oxygen was correlated with occurrence of subgrain-boundary structures and abnormal variations in precipitation rates from grain to grain. Micrographs, graphs. 5 ref. (N7, Ti)

68-N. (English.) **The Kinetics of Precipitation of Barium Sulfate From Aqueous Solution.** D. Turnbull. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 685-691.

Rate of linear growth of barium sulfate crystals is independent of their size and apparently limited by a process occurring at the crystal-solution interface. Graphs, tables. 15 ref. (N12)

69-N. (English.) **Ternary Laves and Sigma-Phases of Transition Metals.** Kehsin Kuo. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 720-724.

Formation of substitutional phases and intermetallic compounds by metals which adjoin each other in periodic system. Tables. 24 ref. (N6)

70-N. (English.) **Order-Disorder in Cu-Au Alloys. I. Short-Range Order in an Alloy Containing 23 Atomic Per Cent Au.** C. H. Sutcliffe and F. E. Jaumot, Jr. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 725-730.

Measurements of diffuse background intensity were made throughout the reciprocal lattice unit cell and analyzed by means of a three-dimensional Fourier analysis. Short-range order parameters are given for the first ten shells surrounding a given atom for three temperatures above the critical temperature. Tables, diagram, graph. 7 ref. (N10, Cu, Au)

71-N. (English.) **On the Nuclear Magnetic Resonance in Metals and Alloys.** N. Bloembergen and T. J. Rowland. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 731-746.

Effects are explained in terms of quadrupole interaction and can give information about state of order or disorder on an atomic scale in the alloy. Graphs. tables, oscillograms. 36 ref. (N10, Sn, Tl, Pb, Na, Mg, In, Hg, Bi, Cu)

72-N. (English.) **Notes on Geisler's Theory of Phase Transformations, With Special Reference to Indium-Thallium Alloys.** Z. S. Basinski and J. W. Christian. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 759-761.

Existence of macroscopic surface tilts is evidence that the characteristic of martensitic reactions is the growth *mechanism* and not the energetics of growth. 8 ref. (N9)

73-N. (English.) **Comment on Paper by Tiller, Jackson, Rutter and Chalmers.** P. Pfann. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 763-764.

Indicates the nature of the equations which govern segregation reactions in the intermediate range, where mixing in liquid is incomplete but nevertheless greater than attained by diffusion alone. 5 ref. (N12)

74-N. (English.) **Nuclear Composition —a Factor of Interest in Nucleation.** Mats Hillert. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 764-766.

Effects of composition of grain nuclei on formation of precipitates. Diagrams. 5 ref. (N2)

75-N. (French.) **On the Introduction of Carbon^{14} Into Pure Iron by Gaseous Cementation.** Philippe Albert. *Revue de métallurgie,* v. 50, no. 12, Dec. 1953, p. 829-831; disc., p. 831-832.

A method which gives good results. Carburization was carried out by means of acetylene prepared from barium carbide containing carbon^{14}. Diagrams, table. (N1, Fe)

76-N. (French.) **The Isothermal Transformation of Austenite and the Distribution of Alloying Elements in Low-Alloy Steels.** Axel Hultgren, et al. *Revue de métallurgie,* v. 50, no. 12, Dec. 1953, p. 847-867.

Various types of transformation have been distinguished and their kinetics determined. Tables, graphs, micrographs. 23 ref. (N8, AY)

77-N. (Russian.) **Influence of Internal Grain Structure of Austenite on the Self Diffusion of Iron.** P. L. Gruzin, E. V. Kuznetsov and G. V. Kurdiumov. *Doklady Akademii Nauk SSSR,* v. 93, no. 6, Dec. 21, 1953, p. 1021-1023.

Effect of internal grain structure in investigating diffusion mechanism in alloys where there are phase transformations. Graph. 6 ref. (N1, N6, Fe)

78-N. (Russian.) **The Electric Resistance of Ni_3Fe Alloys Which Contain Molybdenum.** B. G. Livshits and M. P. Ravdel. *Doklady Akademii Nauk SSSR,* v. 93, no. 6, Dec. 21, 1953, p. 1033-1035.

Shows that decreased ordering occurs continually with increased molybdenum content. Graphs. 11 ref. (N10, P15, Ni, Fe, Mo)

79-N. **The Use of Carbon Crucibles in Measurements on the Rate of Evaporation of Liquid Metals in a Vacuum.** M. G. Rossmann and J. Yarwood. *British Journal of Applied Physics,* v. 5, Jan. 1954, p. 7-13.

Conditions necessary to obtain measurements on evaporation of metals which liquefy at elevated temperatures in a vacuum. Tables, diagram. 8 ref. (N16)

80-N. **Diffusion of Elements in Liquid Iron.** B. V. Stark, E. V. Chelishchev, and E. A. Kazachkov. Henry Brutcher, Altadena, Cal., Translation no. 2840, 7 p. + 2 plates. (From *Izvestiya Akademii Nauk SSSR, OTN,* 1951, no. 11, p. 1689-1695.)

Previously abstracted from the original. See item 161-N, 1952. (N1, Fe)

81-N. **Transformation of Austenite Into Martensite at Subzero Temperature. II.** V. G. Vorob'ev and A. P. Gulyaev. Henry Brutcher, Altadena, Cal., Translation no. 3021, 8 p. (From *Zhurnal Tekhnicheskoi Fiziki,* v. 21, no. 10, 1951, p. 1164-1169.)

Previously abstracted from the original. See item 194-N, 1953. (N8, ST)

82-N. Nitriding of Iron. I. R. Krichevskii and N. E. Khazanova. Henry Brutcher, Altadena, Cal., Translation no. 3028, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 71, no. 3, 1950, p. 481-484.)

Previously abstracted from the original. See item 144-N, 1950. (N8, J28, Fe)

83-N. On the Migration of Austenite Grain Boundaries. M. G. Lozinskii. Henry Brutcher, Altadena, Cal., Translation no. 3044, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 82, no. 1, 1952, p. 53-56.)

Previously abstracted from the original. See item 132-N, 1952. (N3, ST)

84-N. Contribution to the Problem of the Austenite-Martensite Transformation. G. A. Oding. Henry Brutcher, Altadena, Cal., Translation no. 3046, 6 p. (From *Vestnik Mashinostroeniya,* v. 32, no. 3, 1952, p. 69-71.)

A study of martensite transformation over entire temperature range of this transformation at a cooling rate not in excess of 5° F. per min. based on dilatometric method. Table, graphs. 3 ref. (N8, AY)

85-N. (Book.) **1953 Supplement to the Atlas of Isothermal Transformation Diagrams.** 529 p. 1953. United States Steel Corp., Pittsburgh, Pa.

Supplement to 1951 Edition. Contains more than 400 diagrams. References to original sources are given. (N8, ST, CI)

86-N. Aging Characteristics of Nickel-Chromium Alloys Hardened With Titanium and Aluminum. Rolf Nordheim and Nicholas J. Grant. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 211-218.

Results of extensive study of aging by means of hardness, hot electrical resistance, X-ray and microscopy. Micrographs, tables, phase diagram, graphs. 10 ref. (N7, Ti, Cr, Al, Ni)

87-N. A Study of the Effect of Carbon Content on the Structure and Properties of Sintered WC-Co Alloys. Joseph Gurland. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 285-290.

Grain growth of tungsten carbide during sintering was measured. It was shown that the reaction takes place mainly by solution and reprecipitation of the carbide in and from the binder at sintering temperature. Tables, graphs, micrographs, phase diagrams. 13 ref. (N3, H15, W, Co, C-n)

88-N. Orientation Relationships in Cast Germanium. W. C. Ellis and Jacqueline Fageant. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 291-294.

All major regions in a progressively solidified germanium ingot were related through successive orders of octahedral twinning. Occurrence of lineage structure and generation and survival of orientations. Photographs. 10 ref. (N12, Ge)

89-N. Redistribution of Solutes by Formation and Solidification of a Molten Zone. W. G. Pfann. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 294-297.

Formation and slow solidification of a molten zone in a homogeneous ingot produces a discontinuity in solute concentration at boundary of the zone and a gradient of concentration within the zone. Tests were made on germanium. Diagrams, graph, photographs. 9 ref. (N12, Ge)

90-N. On the Temperature Range of the Martensitic Transformation in the Cu-Zn System. A. L. Titchener and M. B. Bever. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 303-304.

Results of experimental studies. Table, graphs. 6 ref. (N9, Cu, Zn)

91-N. Radioisotopes in the Study of Metal Surface Reactions in Solutions. Massoud T. Simnad. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. Institute of Metals, p. 23-58; disc., p. 295-364.

Exchange between metals and ions in solution. Previous experiments and explanations criticized. Several generalizations made regarding mechanism of this phenomenon. Micrographs, table, diagram. 195 ref. (N14, S19)

92-N. (German.) **Special Growth Structures of Metal Crystals Solidified From the Melt.** Friedrich Blaha. *Acta Physica Austriaca,* v. 8, no. 2, Dec. 1953, p. 141-166.

Crystallization tests with zinc, cadmium and tin reveal that slight changes in experimental conditions

will affect crystal structure. Diagrams, photomicrographs. 44 ref. (N12, Zn, Cd, Sn)

93-N. (German.) **Mechanism of Austenite-Martensite Transformation.** Helmut Knapp. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 497-504.

Recent literature on crystallography. Displacement of atoms can be represented by a single matrix. Diagrams. 25 ref. (N8)

94-N. (German.) **Application of Time-Temperature Transformation Diagram of Continuous Cooling to Heat Treating Problems.** Adolf Rose and Werner Strassburg. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 505-514.

Applicability of time-temperature-transformation diagrams as a means of determining cooling process in interior of large blocks of steel and its hardenability. Graphs, table, diagram, micrographs. 33 ref. (N8, J26, ST)

95-N. (German.) **The Mechanism of Graphite Crystallization in Iron.** E. Feil. *Giesserei,* v. 40, no. 24, Nov. 26, 1953, p. 629-634.

Reviews published data on formation of graphite in hypo and hypereutectic iron, flaky and spheroid graphite, crystallization stages during solidification, symmetry of spheroid graphite and chemical investigation of kish. Tables, micrographs, graph. 13 ref. (N8, Fe, ST)

96-N. (German.) **Recovery Phenomena in Copper-Beryllium Alloys Caused by Cold Working.** W. Gruhl and U. Gruhl. *Metall,* v. 8, nos. 1-2, Jan. 1954, p. 20-23.

Experiments reveal that cold working permits repetition of age hardening. Resolution is probably due to local heating or supply of energy from cold working operation. X-rays clearly reveal recovery effect of cold working. Graphs, X-ray recordings. 10 ref. (N4, Cu, Be)

97-N. (German.) **The Crystal-Growth Process of Crystals Far From the Phase Equilibrium.** Ludwig Graf. *Zeitschrift für Naturforschung,* v. 8a, no. 12, Dec. 1953, p. 824-826.

Rapid crystal growth is explained by "kinetic" forms of equilibrium in which rate of crystal growth depends only on conditions at point of growth. 7 ref. (N12)

98-N. (Swedish.) **Diffusion of Carbon in Different Phases of Carbon Steel.** M. Hillert and R. D. Sharp. *Jernkontorets Annaler,* v. 137, no. 11, 1953, p. 785-790.

Use of activity diffusion coefficients. Shows computation of coefficients for carbon in ferrite and austenite. Experimental determination of coefficient for carbon in cementite. 10 ref. (N1, CN)

99-N. Solutions in Liquid Iron. III. Diffusion of Cobalt and Carbon. D. W. Morgan and J. A. Kitchener. *Faraday Society, Transactions,* v. 50, Jan. 1954, p. 51-60.

Technique developed for determining diffusion coefficients of solutes in liquid iron. Tables, graphs, diagrams. 20 ref. (N1, Fe, Co)

100-N. Formation of Ferrite in Hypo-Eutectoid Plain Carbon Steels. C. Margaretha Hickley and J. H. Woodhead. *Iron and Steel Institute, Journal,* v. 176, Feb. 1954, p. 129-139 + 2 plates.

Results of studies during isothermal decomposition of austenite. Graphs, micrographs, table. 24 ref. (N8, CN)

101-N. Kinetics of First-Stage Graphitization in Iron-Carbon-Silicon Alloys. J. Burke and W. S. Owen. *Iron and Steel Institute, Journal,* v. 176, Feb. 1954, p. 147-155.

Experimental studies which throw new light on processes controlling rate of reaction. Tables, graphs, diagram, micrograph. 18 ref. (N8, CI)

102-N. Theoretical Analysis of Diffusion of Solutes During the Solidification of Alloys. Carl Wagner. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 154-160.

Theoretical calculations. Graphs, tables. 19 ref. (N12, Ni)

103-N. Some Ordering Effects in Cu_3Au at About 100° C. R. A. Dugdale and A. Green. *Philosophical Magazine,* v. 45, 7th ser., no. 361, Feb. 1954, p. 163-172.

Using electrical resistance as an indicator for ordering, it is found that Cu_3Au specimens show an ordering effect at about 100° C. Tables, graphs, diagrams. 9 ref. (N10, P15, Cu, Au)

104-N. (English.) **Solubility of Carbon in Ferrite.** Mats Hillert. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 11-14.

Solubility of graphite in ferrite determined by a computation. Table, graph. 10 ref. (N12)

105-N. (English.) **Observations on the Structural Changes Accompanying Recovery in Super-Purity Aluminium.** E. C. W. Perryman. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 26-37.

Structure of super-purity aluminum examined by metallographic

and X-ray methods directly after cold rolling at room and liquid air temperatures. Graphs, tables, photomicrographs. 18 ref. (N4, Al)

106-N. (English.) **Order-Disorder in Cu-Au Alloys. II. The Nature of the Order-Disorder Transformation and Long-Range Order.** Frank E. Jaumot, Jr., and Charles H. Sutcliffe. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 63-74.

Transformations studied in copper-gold alloys containing from 15.5 to 34.2 atomic % gold. Graphs, tables, diagrams. 13 ref. (N10, Cu, Au)

107-N. (English.) **Coherent Growth of Martensite During Tempering.** T. Ko. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 75-79.

Martensite plates in a 1.5% C, 5.0% nickel steel can, during tempering, thicken or grow into bainite. Photomicrographs. 14 ref. (N8, AY)

108-N. (English.) **Solid Solution Formation in the Gold-Nickel System.** B. L. Averbach, P. A. Flinn and Morris Cohen. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 92-100.

Sizes of ions in gold-nickel solutions, measured from diffuse X-ray scattering, are used to calculate strain energies. Reasonable agreement with observed heats of mixing is obtained. Graphs, tables. 27 ref. (N12, Au, Ni)

109-N. (English.) **The Crystallography of the Beta-Alpha Transformation in Titanium.** A. J. Williams, R. W. Cahn and C. S. Barrett. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 117-128.

Orientation relationships, habit plane and surface contour associated with martensitic transformation in iodide titanium investigated. Diagrams, micrographs. 23 ref. (N9, Ti)

110-N. (English.) **The Crystallography of Martensite Transformations. I-II.** J. S. Bowles and J. K. Mackenzie. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 129-147.

Experiments to obtain a consistent description of atomic displacements. 4 ref. (N8, N9)

111-N. (English.) **Experiments on the Martensitic Transformation in Single Crystals of Indium-Thallium Alloys.** Z. A. Basinski and J. W. Christian. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 148-166.

Transformation from face-centered cubic to face-centered tetragonal phase studied in alloys containing 18.5% thallium, using ciné-photography and X-ray methods. Diagrams, micrographs. 23 ref. (N9, In, Tl)

112-N. (Dutch.) **Growth and Orientation of Crystallites in Eutectic Alloys.** H. Tober. *Metalen,* v. 8, no. 24, Dec. 31, 1953, p. 429-436.

Microscopic observations on lead-tin alloys of different compositions quenched at various stages of solidification. Micrographs, photographs, diagrams. 4 ref. (N12, Pb, Sn)

113-N. (French.) **Application of Electronic Microdiffraction to Investigation of Phase Transformations of Al-Cu Alloys.** Noboru Takahashi and Charles Fert. *Comptes rendus,* v. 237, no. 25, Dec.21, 1953, p. 1664-1666.

Method applied to aluminum-copper film permits following of phase transformation in crystalline state. Micrographs. 4 ref. (N6, Cu, Al)

114-N. (French.) **Ion Diffusion Through Electrolytic Metallic Coatings.** Jean Royon. *Comptes rendus,* v. 237, no. 25, Dec. 21, 1953, p. 1694-1696.

Characteristics of diffusion phenomena. Graphs. 2 ref. (N1, L17, Cu)

115-N. (French.) **Effect of Stresses on Martensite Transformation.** Charles Crussard. *Comptes rendus,* v. 237, no. 25, Dec. 21, 1953, p. 1708-1711.

A more precise theory is developed. Results compared to calculations made by Italian mathematicians. 3 ref. (N8, ST)

116-N. (German.) **The Metallography of Light Metals. VII. Investigation of Dendritic Crystallization of Pure Aluminum.** Hans Kostron and Margarete Schippers. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 477-489.

Investigation indicates phenomena of rythmic oscillation during solidification of commercial aluminum resulting in structural patterns resembling growth rings in trees. Table, diagrams, micrographs. 22 ref. (N12, Al)

117-N. (German.) **The Metallography of the Light Metals. IX. Observations on the Structure of Continuously Cast Water-Chilled Ingots of 99.5 Al.** Hans Kostron and Margarete Schippers. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 489-494.

Metallographic study to determine freezing rate in various zones. Diagrams, micrographs, photographs. 7 ref. (N12, Al)

118-N. (German.) **Contribution to the Crystallization of Al-Si Alloys.** Gus-

tav Gürtler. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 503-509.

Granular and laminar form of silicon crystals. Change of anomalous aluminum-silicon eutectic into a normal eutectic shown to be the result of supercooling of phosphorus-free alloys. Table, graphs, micrographs. 30 ref. (N12, Al, Si)

119-N. (Russian.) **Effect of Silicon on the Speed of Carbon Diffusion in Austenite.** M. A. Krishtal. *Doklady Akademii Nauk SSSR,* v. 92, no. 5, Oct. 11, 1953, p. 951-953.

Dependence of thickness of the austenite layer on time at various temperatures. Formula given and discussed. Graph, diagram. 6 ref. (N1, N8, Si, AY)

120-N. (Russian.) **State of Martensite Crystals of Hardened Low-Carbon Steels.** G. V. Kurdiumov, M. D. Perkas and A. E. Shamov. *Doklady Akademii Nauk SSSR,* v. 92, no. 5, Oct. 11, 1953, p. 955-957.

Shows that when carbon steel with 0.1% carbon is abruptly quenched the martensite has no time to decompose and carbon is maintained in solid solution. Graphs. 10 ref. (N8, CN)

121-N. **Ageing Curves at 110° C. on Binary and Ternary Aluminium—Copper Alloys.** H. K. Hardy. *Institute of Metals, Journal,* v. 82, Feb. 1954, p. 236-238.

Ternary alloys with indium or tin reached peak hardness at shorter aging times. Graphs. 3 ref. (N7, Al, Cu)

122-N. **Structural Ageing Characteristics of Binary Aluminium—Copper Alloys.** J. M. Silcock, T. J. Heal and H. K. Hardy. *Institute of Metals, Journal,* v. 82, Feb. 1954, p. 239-248 + 2 plates.

X-ray studies on single crystals. Data agree with aging curves. Tables, diagram, graphs. 21 ref. (N7, Al, Cu)

123-N. **Heterogeneity of Austenite.** I. A. Oding and M. G. Lozinskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3126, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 89, no. 2, 1953, p. 275-278.)

Previously abstracted from original. See item 273-N, 1953. (N8, ST)

124-N. **Reactions of Molten Zinc-Aluminum Alloys With Solid Iron.** E. Gebhardt and I. Schmidt. *Henry Brutcher, Altadena, Calif., Translation no.* 3128, 15 p. (From *Zeitschrift für Metallkunde,* v. 39, no. 11, 1947, p. 321-325.)

Weight losses of iron specimens in molten Zn-Al and Zn-Al-Cu were plotted against reaction time and bath composition. Graphs, micrographs. 12 ref. (N12, Zn, Al, Fe)

125-N. **Effect of Magnesium Upon Surface Tension, Supercooling, and Crystallization of Austenitic Steel.** N. S. Kreshchanovskii and R. P. Zaletaeva. *Henry Brutcher, Altadena, Calif., Translation no.* 3130, 7 p. (From *Liteinoe Proizvodstvo,* v. 4, no. 3, 1953, p. 20-21.)

Experimental study of influence of magnesium additions ranging from 0 to 0.50%. Graphs, micrographs. 4 ref. (N12, P10, AY)

126-N. **Formation and Properties of Delta Iron (Ferrite) and Sigma Phase in Austenitic Chromium-Nickel Steels.** I. H. Buchholtz, H. Krachter and F. Kraemer. *Henry Brutcher, Altadena, Calif., Translation no.* 3150, 22 p. (From *Archiv für das Eisenhüttenwesen,* v. 24, nos. 3-4, 1953, p. 113-125.)

Previously abstracted from original. See item 196-N, 1953. (N8, P general, Q general, SS)

127-N. **On the Kinetics of Development of the Graphite Structure in Cast Iron.** K. P. Bunin and I. V. Salli. *Henry Brutcher, Altadena, Calif., Translation no.* 3169, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 83, no. 6, 1952, p. 841-842.)

Previously abstracted from original. See item 222-N, 1952. (N8, CI)

128-N. (English.) **Anelastic Study on the Diffusion Coefficients of Alpha-Brass.** Nobuhiko Kunitomi. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 4, Aug. 1953, p. 335-342.

Anelastic relaxation in alpha brass was measured in temperature range from about 20 to 400° C. Chemical diffusion coefficient was calculated from these results. Diagram, graphs. 19 ref. (N1, Q22, Cu)

129-N. (English.) **Growth Rates of New Grains During the Primary Recrystallization of Aluminium Plates.** Hideji Suzuki. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 5, Oct. 1953, p. 413-432.

Effects of impurity, temperature, deformation and grain size were determined on cold worked specimens of high-purity aluminum and aluminum alloys containing up to 2.0% of copper. Tables, graphs. 15 ref. (N3, N5, Al)

130-N. (French.) **Influence of Hydrogen or Nitrogen Insertion on Allotropic Transformation Temperature of Cobalt.** André Michel, Jean Drain and Raymond Bridelle. *Comptes rendus,* v. 238, no. 1, Jan. 4, 1954, p. 107-108.

Extreme purity of metal shown to be indispensible for such studies. Partial irreversibility found for the alpha-beta transformation. 9 ref. (N6, Co)

131-N. Segregated Graphite in Steel. J. J. Kanter. *American Petroleum Institute, Proceedings,* sec. III, v. 33, 1953, p. 225-229; disc., p. 245-252.

Causes and remedies of graphitization problems. 1 ref. (N8)

132-N. The Effect of Compression and of Hydrostatic Pressure on the Diffusion Anisotropy in Zinc. T. Liu and H. G. Drickamer. *Journal of Chemical Physics,* v. 22, Feb. 1954, p. 312-319.

Measurements made on rate of self diffusion in single crystals along directions both parallel and perpendicular to the *C* axis. Graphs, diagrams, tables. 13 ref. (N1, Zn)

133-N. On the Mechanism of Grain Growth in Metals, With Special Reference to Steel. D. G. Cole, P. Feltham and E. Gillam. *Physical Society, Proceedings,* v. 67, no. 410B, Feb. 1954, p. 131-137.

Rate of grain growth in initial stages of isothermal austenitizing studied by thermal etching method in plain, eutectoid carbon steel in range 840 to 970° C. Graphs, micrographs. 24 ref. (N3, CN)

134-N. Orientation of Cementite in Tempered Carbon Steel. I. V. Isaichev. *Henry Brutcher, Altadena, Calif., Translation no.* 3213, 8 p. (From *Zhurnal Tekhnicheskoi Fiziki,* v. 17, no. 7, 1947, p. 835-838.)

Previously abstracted from original. See item 4-188, 1947. (N5, CN)

135-N. (English.) **Factors Influencing the Isothermal Transformation of Austenite in the Intermediate Range (Bainite Range).** Otto Schaaber. *Draht (English Ed.),* Feb., 1954, no. 19, p. 19-25.

Fundamental features of the isothermal transformation of austenite. Graphs, photograph, tables. (To be continued.) (N8, ST)

136-N. (Czech.) **Examining Structural Changes in Connection With Secondary Hardening of Low-Alloy Boiler Steel by Electronographic Method.** Frantisek Kralik. *Hutnické Listy,* v. 9, no. 2, Feb. 1954, p. 77-83.

Precipitation of alloy carbides at temperatures between 450 and 700° C. considered as primary cause for secondary hardening. Tables, micrographs, photographs, graph. 4 ref. (N7, AY, Mo, V)

137-N. (French.) **Effect of Impurities on Allotropic Transformation of Cobalt and Its Alloys.** Jacques Pomey and René Lucien Le Roux. *Comptes rendus,* v. 238, no. 7, Feb. 15, 1954, p. 814-815.

Importance of carbon, nitrogen, iron and hydrogen in transformation from alpha to beta phase. Large quantities of impurities are necessary for stability in beta phase. (N6, Co)

138-N. (French.) **Influence of Cold Working After Tempering on Phases in Copper-Aluminum Alloys Containing 4% Copper.** Rene Graf and Andre Guinier. *Comptes rendus,* v. 238, no. 7, Feb. 15, 1954, p. 819-821.

X-ray study of polycrystalline specimen shows that cold working speeds up formation of theta prime and theta precipitates. Table. 3 ref. (N6, N7, Al)

139-N. (French.) **Practical Effects of the Grain and Texture in Nonferrous Metals.** Jean Hérenguel. *Métaux, Corrosion-Industries,* v. 29, no. 341, Jan. 1954, p. 1-13.

Formation of texture during solidification and its effect on mechanical properties and recrystallization. Micrographs, table, diagrams, photographs. 9 ref.
(N12, N5, Q general, Al, Mg, Zn)

140-N. (French.) **A Method of Calculating Grains and Its Applications.** W. Dickenscheid. *Métaux, Corrosion-Industries,* v. 29, no. 341, Jan. 1954, p. 14-23.

Method for measuring distribution of crystals. Example of application to isothermal recrystallization as a function of time, temperature and gamma-alpha transformation. Tables, graphs. (N5, M27, Al)

141-N. (German.) **Investigation of Nickel-Carbon Alloys and Cast Iron.** Erich Scheil. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 71-76.

Shows that graphite of these alloys crystallizes directly, not through decomposition of carbide. Graphs, micrographs. 24 ref.
(N12, N8, Ni, CI)

142-N. (German.) **The Mechanism of Crystal Growth Far From the Phase Equilibrium.** Ludwig Graf. *Zeitschrift für Metallkunde,* v. 45, no. 1, Jan. 1954, p. 36-47.

Rapid crystal growth is a kinetics process. Formation of dendrites in rapidly cooling melts is a normal phenomenon of rapid growth conditions as a manifestation of kinetic equilibrium. Photographs, micrographs. 67 ref.
(N12, Cu, Al, Ag, Fe, Cd, Zn)

143-N. An Investigation on the Isothermal Transformation of an Aluminium Bronze. E. G. Ramachan-

dran and A. Subramanya Iyer. *Indian Institute of Science, Journal,* v. 36, sec. A, Jan. 1954, p. 14-19 + 2 plates.

Transformation of beta-phase studied microscopically and from hardness data at constant temperatures from 350 to 560° C. Table, graphs. 3 ref. (N6, Cu)

144-N. Effect of Hydrogen on the Continuous-Cooling Transformation Diagram for a Manganese-Molybdenum Steel. C. L. M. Cottrell. *Iron and Steel Institute, Journal,* v. 176, Mar. 1954, p. 273-282 + 1 plate.

Diagrams cover range of cooling rates occurring during normal arc-welding process and were observed for steel both with and without supersaturation with hydrogen. Probable effects of hydrogen on hard-zone cracking. Tables, diagram, graphs, micrographs. 19 ref. (N8, K1, AY)

145-N. Radiation Damage Effects on Order-Disorder in Nickel-Manganese Alloys. Lewis R. Aronin. *Journal of Applied Physics,* v. 25, Mar. 1954, p. 344-349.

Fast neutron irradiation in nuclear reactor on order-disorder series of nickel-manganese alloys ranging from 16.5 to 31.9 atomic-% manganese studied by resistivity and magnetic induction measurements. Graphs. 16 ref. (N10, Ni, Mn)

146-N. Diffusion of Gold Into Copper. A. B. Martin, R. D. Johnson and Frank Asaro. *Journal of Applied Physics,* v. 25, Mar. 1954, p. 364-369.

Radioactive tracer techniques utilized to measure rate of diffusion over temperature range from 1000 to 375° C. Graphs, tables. 19 ref. (N1, Cu, Au)

147-N. The Nonsteady Rate of Nucleation of a New Phase Under Great Supercooling. B. Ya. Lyubov. *National Science Foundation Translation, no.* 109, Nov. 1953, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 245-248.)

Experiments show high-temperature phase may be preserved at low temperatures for a long time in a metastable state. Graph. 3 ref. (N2)

148-N. On Local Distortions of the Crystal Lattices of Alloys During Transformation Hardening. L. Moroz and T. Mingin. *National Science Foundation Translation, no.* 99, Oct. 1953, 3 p. (From *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 249-251.)

Previously abstracted from original. See item 14-N, 1954. (N6, M26, Fe)

149-N. Further Studies of the Mechanism by Which Hydrogen Enters Metals During Chemical and Electrochemical Processing. L. D. McGraw, W. E. Ditmars, C. A. Snavely and C. L. Faust. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3164, Mar. 1954, 37 p.

Current work shows entry of hydrogen into metals occurs when hydrogen-metal alloy formation is simultaneous with discharge of hydrogen atoms. Graphs, diagrams, tables. 17 ref. (N1, ST, Fe)

150-N. Crystal Growth and Crystal Boundary Techniques. Bruce Chalmers. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 170-183; disc., p. 184-185.

Methods for preparation of single crystals include growth from vapor and solution, solidification of a melt and re-arrangement of atoms in solid state. Diagrams. 19 ref. (N12)

151-N. Reaction of Nitrogen With, and the Diffusion of Nitrogen in, Thorium. A. F. Gerds and M. W. Mallett. *Electrochemical Society, Journal,* v. 101, Apr. 1954, p. 175-180.

Rates of reaction of nitrogen with thorium determined for temperature range 670 to 1490° C. at atmospheric pressure. Rates of diffusion of nitrogen in thorium obtained over the temperature range 845 to 1490° C. at atmospheric pressure. Micrograph, graphs, tables. 13 ref. (N1, Th)

152-N. Adsorption Studies on Metals. III. The Sorption of Water Vapor on Nickel, Steel and Molybdenum. A. C. Zettlemoyer and J. J. Chessick. *Journal of Physical Chemistry,* v. 58, Mar. 1954, p. 242-245.

Study of oxide films present on surfaces of nickel, steel and molybdenum using both gas adsorption and calorimetric techniques. Graph, tables. 7 ref. (N15, Ni, ST, Mo)

153-N. Hardness and Microstructure of an Alpha-Beta Titanium Alloy Quenched From Temperatures in the Range 600°-1,000° C. A. Greenwood and W. Evans. *Metallurgia,* v. 49, no. 293, Mar. 1954, p. 124-126.

Minimum hardness at 700° C. and progressive increase to 950° C. Beta grain growth occurred after completion of alpha-beta transformation. Limited amount of reversion of beta to alpha took place on quenching. Table, graph, micrographs. (N6, N3, Q29, Ti)

154-N. Diffusion of Antimony in Silver. E. Sonder, L. Slifkin and C. T. Tomizuka. *Physical Review,* v. 93, ser. 2, Mar. 1, 1954, p. 970-972.

Diffusion coefficient of antimony tracers in single crystals of pure silver measured as function of temperature over range 468 to 942° C. Tables, graphs. (N1, Sb, Ag)

155-N. Diffusivity and Solubility of Copper in Germanium. C. S. Fuller, J. D. Struthers, J. A. Ditzenberger and K. B. Wolfstirn. *Physical Review,* v. 93, ser. 2, Mar. 15, 1954, p. 1182-1189.

Function of temperature in range 700 to 900° C., by resistivity and radioactivity methods. Results account for changes occurring in resistivity of germanium upon heat treatment. Diagram, graphs, radiographs, table. 35 ref.

(N1, N12, P15, Ge, Cu)

156-N. Recrystallization of Germanium From Indium Solution. Jacques I. Pankove. *RCA Review,* v. 15, Mar. 1954, p. 75-85.

Upon cooling a germanium-in-indium solution in contact with solid germanium, germanium from the supersaturated solution recrystallized onto the solid crystal in epitaxial fashion. Micrographs, photographs, diagrams. 1 ref.

(N5, Ge, In)

157-N. Spiral Growths on Large Crystal Surfaces. Helen Rae and A. E. Robinson. *Royal Society, Proceedings,* v. 222, ser. A, Mar. 23, 1954, p. 558-562 + 2 plates.

Cause of twinning occurring in lithium sulfate monohydrate crystals. Twinning is associated with condition of high supersaturation in nutrient solution and is frequently accompanied by spontaneous microcrystallization. Diagrams. 2 ref. (N12)

158-N. Formation and Properties of Delta Iron (Ferrite) and Sigma Phase in Austenitic Chromium-Nickel Steels. II. H. Buchholtz, H. Krächter and F. Kraemer. *Henry Brutcher, Altadena, Calif., Translation no.* 3151, 20 p. (From *Archiv für das Eisenhüttenwesen,* v. 24, nos. 3-4, 1953, p. 113-125.)

Previously abstracted from original. See item 196-N, 1953.

(N8, P general, Q general, SS)

159-N. On the Primary Crystallization of Spheroidal Graphite Cast Iron. H. Gries and U. Maushake. *Henry Brutcher, Altadena, Calif., Translation no.* 3175, 19 p. (Condensed from *Giesserei, Technisch-Wissenschaftliche Beihefte,* 1953, no. 10, Mar., p. 493-502.)

Occurrence of graphite spheroids. Reviews literature on nuclei, crystal structure and crystallization process. Micrographs, table. 50 ref. (N12, CI)

160-N. Structural Changes in Metal During Creep. B. M. Rovinskii and L. M. Rybakova. *Henry Brutcher, Altadena, Calif., Translation no.* 3224, 15 p. (From *Izvestiya Akademii Nauk SSSR,* OTN, 1953, no. 9, p. 1241-1247.)

Studies Armco iron at 750 and 840° F. and titanium-stabilized 18-8 steel at 1065 and 1155° F. at various residual deformations ranging from 0 to 7%. Graphs, micrographs. 7 ref. (N general, Q3, Fe, SS)

161-N. (English.) **Grain Boundary Self-Diffusion in Zinc.** Edward S. Wajda. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 184-187.

Self-diffusion measured in temperature range 75 to 200° C. using Zn^{65} as tracer and usual lathe sectioning technique. Graphs, table. 7 ref. (N1, Zn)

162-N. (English.) **The Supersaturation and Precipitation of Vacancies During Diffusion.** R. W. Balluffi. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 194-202.

Metallographic evidence supports viewpoint that porosity formed during diffusion is produced by heterogeneous nucleation of supersaturated vacancies pumped into one side of diffusion zone by unequal diffusion currents of Kirkendall effect. Micrographs, table. 12 ref. (N1)

163-N. (English.) **Diffusion of Hydrogen in Mild Steel.** Al. Demarez, Arthur G. Hock and Francis A. Meunier. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 214-223.

Apparatus can be used for rapid determination of total hydrogen content and diffusion coefficient. Graphs, tables, diagram. 25 ref. (N1, CN)

164-N. (English.) **The Crystallography of Martensite Transformations. III. Face-Centred Cubic to Body-Centred Tetragonal Transformations.** J. S. Bowles and J. K. MacKenzie. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 224-234.

Geometrical theory previously developed is applied. Predictions of habit planes, orientation relationships and other geometrical features are compared with experimental data for iron-carbon, iron-nickel and iron-nickel-carbon alloys. Graph, diagrams, tables. 22 ref. (N8, Fe, ST, AY)

165-N. (English.) **Spontaneous Deformation of Austenite During Martensitic Transformations.** B. Edmondson and T. Ko. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 235-241.

Metallographic examination shows plastic deformation takes place during transformations occurring in 34% nickel-iron alloy during heating and cooling. Micrographs. 16 ref. (N8, AY)

166-N. (English.) **The Effects of Certain Alloying Elements on the Allotropic Transformation in Titanium.** H. W. Worner. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 310-212.

Alloying elements with atomic sizes close to that of titanium considered. Change in enthalpy which accompanies transfer of 1 gr.-atom of any given solute from beta to alpha phase is used to indicate effect of solute on alpha $\rightleftharpoons$ beta transformation. Graph. 10 ref. (N6, Ti)

167-N. (English.) **The Rate of Growth of Dendrites in Supercooled Tin.** A. Rosenberg and W. C. Winegard. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 342-343.

Relates rate of growth of dendrites to degree of supercooling in a melt of tin. Graph. 2 ref. (N12, Sn)

168-N. (English.) **The Relation of the Disordering of a Super-Lattice to the Melting of the Disordered Alloy.** R. A. Oriani. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 343-344.

Constancy of ratio of critical temperature to solidus temperature is examined. Simple relation is shown. Table. 13 ref. (N10)

169-N. (English.) **An Equation for the Solubility Surface of Ternary "Sub-Regular" Solutions.** H. K. Hardy. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 348-349.

Mathematic analysis leading to equations defining the solubility curve. 4 ref. (N12)

170-N. (French.) **On the Mechanism of Diffusion in Solid Solutions.** C. Crussard. *Acta Mtallurgica,* v. 2, no. 2, Mar. 1954, p. 296-301.

By analyzing mechanism of thermal agitation and using theory based on interference of waves of thermal agitation, a satisfactory explanation of discrepancies in Arrhenius' law is possible. Graph. 7 ref. (N1)

171-N. (French.) **Investigations on the Texture of Orientation and the Allotropic Transformation of Cobalt.** Hervé Bibring and Francois Sebilleau. *Comptes rendus,* v. 238, no. 9, Mar. 1, 1954, p. 1026-1028.

Experiments on electrolytic cobalt with a purity greater than 99.5%, degassed at 1200° C. for five days prior to any mechanical or heat treatment. Graphs. 1 ref. (N6, Co)

172-N. (French.) **Present State of Metallography of Alloyed Austenites, Particularly in 18-8 Steels. III. Martensite-Type Reactions in Austenites Having a High Content of Alloying Elements.** Paul Bastien and Jacques Dedieu. *Métaux, Corrosion-Industries,* v. 29, no. 342, Feb. 1954, p. 49-56.

Graphic representation of anisothermal reaction. Cold-hardening and isothermal martensitic reactions at low temperatures. Graphs, micrographs. 26 ref. (N8, SS)

173-N. (French.) **Role of Surface Films on the Reaction of Zirconium With Hydrogen.** E. A. Gulbransen and K. F. Andrew. *Revue de métallurgie,* v. 51, no. 2, Feb. 1954, p. 101-107; disc., p. 107.

Current concepts of occlusion of hydrogen by metals. Compares hydrogen reaction for clean metal surfaces and for surfaces contaminated with oxide films. Tables, graphs. 10 ref. (N15, Zr)

174-N. (French.) **On the Equilibrium Between Carbon and Oxygen Dissolved in Liquid Iron.** Pierre Vallet. *Revue de métallurgie,* v. 51, no. 2, Feb. 1954, p. 115-128.

Causes of scatter of results analyzed. Errors in method and their avoidance. Tables, graphs. 5 ref. (N12, Fe)

175-N. (French.) **Study of Submicroscopic Precipitation in Heat-Resistant 80:20 Type Nickel-Chromium Alloys.** Y. Baillie and J. Poulignier. *Revue de métallurgie,* v. 51, no. 3, Mar. 1954, p. 179-190; disc., p. 190-191.

Method is delicate enough to give sharp pictures of precipitate developed. Micrographs, graphs. 8 ref. (N7, Ni, Cr)

176-N. (German.) **Formation of Spheroidal Graphite in Cast Iron by Washing the Melt With Argon.** P. König and B. Marincek. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 2, Feb. 1954, p. 41-44.

Argon was passed into superheated melt. Table, micrographs. (N12, CI)

177-N. (German.) **Investigation of Rolling and Recrystallization Textures of Aluminum. I. Textures of Cold Rolled Pure Aluminum.** Kurt Lücke. *Zeitschrift für Metallkunde,* v. 45, no. 2, Feb. 1954, p. 86-92.

Compares results with those of other investigators. Diagrams. 16 ref. (N5, Q24, Al)

178-N. (Russian.) **Stabilization Phenomenon During Reverse Martensitic Transformation.** Ia. M. Golovchiner and Iu. D. Tiapkin. *Doklady Akademii Nauk SSSR,* v. 93, no. 1, Nov. 1, 1953, p. 39-42.

Stabilization effect of alpha phase. Investigates annealing of nickel-iron and nickel-titanium-iron alloys at 1100° C. for four hours, then cooling to −196° C. in liquid nitrogen. Graphs. 7 ref.
(N8, N9, Ni, Fe)

179-N. (Russian.) **Problem of the Passive, Orienting Influence of a Solid Base on Growing Crystals.** P. A. Shumskii. *Doklady Akademii Nauk SSSR,* v. 93, no. 1, Nov. 1, 1953, p. 51-54.

Investigates passive-type crystal growth of polycrystalline aggregates applicable to petrographic studies and to conditions of crystallization of alloys. Diagrams. 5 ref. (N12)

180-N. (Swedish.) **The Effect of Deformation, Temperature, and Chemical Composition on the Formation of Martensite in Austenitic Stainless Steels.** Tryggve Angel. *Jernkontorets Annaler,* v. 138, no. 3, 1954, p. 117-141.

Experimental studies of isothermal martensite formation as a function of strain, stress and deformation energy. Graphs, micrographs, table, diagram. 28 ref. (N8, SS)

181-N. A Precipitation-Hardenable Copper - Nickel - Silicon - Aluminum Alloy. D. B. Roach, R. B. Fischer and J. H. Jackson. *American Society for Metals, Transactions,* v. 46, 1954, p. 329-345; disc., p. 346-347.

Alloy can be readily formed in solution-treated condition and hardened by aging to have a proportional limit of 85,000 psi., a yield strength of 120,000 psi. and a tensile strength of 140,000 psi., with an elongation of 8% and modulus of elasticity in tension of 19 million psi. Tables, graphs. 11 ref.
(N7, Q23, Al)

182-N. How Dissolved Nitrogen Affects Graphitization. G. V. Smith. *Iron Age,* v. 173, Apr. 15, 1954, p. 136-139.

Nitrogen dissolved in aluminum killed steel inhibits graphitization. Instability of iron carbide is the graphitization problem. Table, micrographs, graph. (N8, ST)

183-N. Structural Changes During Annealing of White Cast Irons of High S:Mn Ratios, Including the Formation of Spherulitic and Non-Spherulitic Graphite and Changes in Sulphide Inclusions. Axel Hultgren and Gustaf Ostberg. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 351-365 + 11 plates.

Mechanism of formation of dispersed graphite flake nests, compact nests and spherulites during annealing at 900 to 1150° C. studied by examining microstructures of quenched specimens. Graphs, diagrams, tables, micrographs. 20 ref.
(N8, J23, CI)

184-N. Eutectic Solidification in Grey, White, and Mottled Hypo-Eutectic Cast Irons. A. Hultgren, Y. Lindblom and E. Rudberg. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 365-374 + 8 plates.

Samples quenched at predetermined points on cooling curves. Sections examined for evidence of processes occurring during cooling. Micrographs, tables, graphs, diagrams. 6 ref. (N12, CI)

185-N. Undercooled Graphite in Cast Irons and Related Alloys. H. Morrogh and W. J. Williams. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 375-378 + 2 plates.

Develops view that undercooled graphite is formed by decomposition of white iron structure shortly after solidification. Composition of silicocarbide. Graph, micrographs. 8 ref. (N8, CI)

186-N. The Solidification of Iron-Phosphorus-Carbon Alloys. H. Morrogh and P. H. Tütsch. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 382-384 + 2 plates.

In place of normal ledeburite, phosphorus in small amounts causes formation of degenerate eutectic structure. In large amounts it gives rise to austenite dendrites and cementite of hyper-eutectic appearance. Table, diagram, micrographs. 4 ref. (N12, CI)

187-N. Decomposition of Cementite During Solidification of Cast Iron. A. Berman and V. Kondic. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 385-387.

Origin of graphite in cast iron investigated by comparing time required for graphite to form on cooling with that required for cementite to decompose at eutectic temperature. Micrograph, graph, diagrams. 6 ref. (N12, CI)

188-N. Metallography of Delta-Ferrite. I. Eutectoid Decomposition of Delta-Ferrite. Kehsin Kuo. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 433-441 + 4 plates.

Delta-ferrite in high-molybdenum steel decomposed in eutectoid manner within temperature range 900 to 1150° C., giving austenite and

the Fe_3Mo_3C carbide. Suggests slow diffusion of molybdenum is controlling factor for three internally connected transformations. Micrographs, table, graphs. 28 ref. (N9, AY)

189-N. (German.) **Determination of Melts and Classification of Solids Into "Volume Weak" and "Volume Strong" Solids at High Temperatures.** A. Knappwost and H. Restle. *Zeitschrift für Elektrochemie,* v. 58, no. 2, 1954, p. 112-118.

Definition of terms. Observations of solidification phenomena of various materials. Graphs, diagrams, table, photograph. 10 ref. (N12, E25, Cd, Zn, Pb, Al)

190-N. (German.) **Diffusion Phenomena in Powder Metal Blanks.** Horst Schreiner and Johann Mariacher. *Zeitschrift für Metallkunde,* v. 45, no. 3, Mar. 1954, p. 108-111.

Contact method developed by R. Lindner using radioactive silver^{110}-copper. Table, graph, radiograph. 8 ref. (N1, H11, Ag, Cu)

191-N. (Russian.) **Influence of Carbon on the Self-Diffusion of Iron in the Iron-Nickel System.** P. L. Gruzin and E. V. Kuznetsov. *Doklady Akademii Nauk SSSR,* v. 93, no. 5, Dec. 11, 1953, p. 809-812.

Coefficients of self-diffusion measured by means of a radioactive Fe^{59} isotope in range from 800 to 1300° C. for alloys containing 20% nickel and in range from 1050 to 1330° C. for alloys containing 25% nickel. Tables, graphs. 4 ref. (N1, Fe, Ni)

192-N. (Russian.) **Influence of the Rate of Heating on the Recrystallization of Steel.** B. G. Sazonov. *Doklady Akademii Nauk SSSR,* v. 93, no. 5, Dec. 11, 1953, p. 817-820.

A new concept based on orientation and dimensional correspondence of transforming phases and emergence of internal stresses connected with volumetric effect during formation of the new phase. Micrographs. 5 ref. (N5, ST)

193-N. (Russian.) **Heats of Activation During the Diffusion of Boron Into Tungsten and Molybdenum.** G. V. Samsonov. *Doklady Akademii Nauk SSSR,* v. 93, no. 5, Dec. 11, 1953, p. 859-861 + 1 plate.

Specimens were heated in a boron bath from 900 to 1300° C. Results reveal same regularity as observed for variation of other physical properties with change incompleteness of the electron d-level of a transition metal and strength of retention of elecrons by a metalloid. Graph, table, micrograph. 3 ref. (N1, P12, W, Mo, B)

194-N. Heat-Treatment of High-Speed Steel. IV. Transformations on Cooling From the Austenitising Temperature. S. G. Cope. *Metal Treatment and Drop Forging,* v. 21, Apr. 1954, p. 183-190, 204.

Transformation within certain temperature ranges, effect of holding metal at elevated temperatures on transformations during subsequent cooling and potentialities of isothermal heat treatments. Graphs, table. 24 ref. (To be continued.) (N8, J26, TS)

195-N. The Transformation of Alpha-Iron to Gamma-Iron During Abrasion. R. P. Agarwala and H. Wilman. *Royal Society, Proceedings,* v. 223. ser. A, Apr. 22, 1954, p. 167-174 + 1 plate.

Abrasion of surface of an iron crystal, by a single 10-in. stroke on 0000 emery with light hand pressure, led to disorientated alpha-iron surface layer containing some randomly disposed gamma-iron. Results indicate a simpler mechanism of transformation than previously proposed. Diagrams, radiograms. 14 ref. (N8)

196-N. (English.) **Self-Diffusion in Liquid Indium.** G. Careri, A. Paoletti and F. L. Salvetti. *Nuovo cimento,* v. 11, ser. 9, no. 4, Apr. 1, 1954, p. 399-406.

Coefficient measurement in range 160 to 480° C. Results close to those for liquid mercury. Graphs, table. 11 ref. (N1, In)

197-N. (German.) **Research on Transformation Tendency and Hardenability of Steels.** Erich Greulich. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 137-149; disc., p. 149-152.

Minimum half-life of isothermal austenite transformation considered as a characteristic index. Time - temperature - transformation diagrams of six steels alloyed with chromium, molybdenum, nickel, silicon and vanadium determined. Graphs, tables, micrographs. (N8, J26, AY, SS)

198-N. (German.) **Segregation Phenomena in a Chromium-Nickel Steel With 4.5% Nickel.** Werner Jellinghaus. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 165-167.

Magnetometric and metallographic study of steel heat treated up to 93 hr. in alpha-gamma transformation range to investigate segregation of nickel. Effect on mechanical properties. Table, graphs, micrographs. (N8, Q general, AY)

199-N. (Russian.) **Mechanism of the Influence of Silicon on Graphitization**

of Iron Alloys. K. P. Bunin. *Doklady Akademii Nauk SSSR,* v. 95, no. 1, Mar. 1954, p. 97-100.

Formation of diffusion micropores in iron-silicon system. Graphs, micrograph. 19 ref. (N8, Fe, Si)

200-N. Melting and Freezing. Bruce Chalmers. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 519-532.

Experimental and theoretical studies of phenomena emphasize structure of resulting metal. Tables, diagrams, graphs, micrographs. 15 ref. (N12)

201-N. A Rationalization of the Oxygen Solid Solubility in Some Transition Metals. A. U. Seybolt and R. L. Fullman. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 548-549.

Results of experimental studies. Table, graph. 8 ref. (N12)

202-N. Primary and Secondary Recrystallization in Cold Rolled Bicrystals of Silicon Iron. C. G. Dunn. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 549-550.

Traces origin of secondary recrystallization grains produced on annealing a cold rolled bi-crystal specimen. Micrograph. 6 ref. (N5, AY)

203-N. Role of Strain Energy in Solid Solution Thermodynamics. E. S. Machlin. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 592-593.

Mathematical analysis. Table. 5 ref. (N12, P12)

204-N. Investigation of the Grain Coarsening Behavior of Some Aluminum Alloys. Harold Bernstein. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Mettallurgical Engineers, Transactions,* v. 200, May 1954, p. 603-606.

Effects of melt composition, pour temperature and mold temperature. Results support carbide theory of nucleation as opposed to peritectic theory. Tables, graphs, photographs. 6 ref. (N2, N3, Al)

205-N. Determination of the Self-Diffusion Coefficients of Gold by Autoradiography. Harry C. Gatos and Anthony D. Kurtz. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 616-619.

Materials, apparatus, techniques and results of experimental studies. Diagram, graphs. 5 ref. (N1, Au)

206-N. Allotropic Transformations at High Temperature. James O. McCaldin and Pol Duwez. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 619-620.

Equipment and techniques of experimental studies. Graph, diagram. 6 ref. (N6, V, Co, Cr, Ru, Re, Os, Rb, Ir, Mo, Th)

207-N. Solubility of Oxygen in Alpha Iron. A. U. Seybolt. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 641-644.

Solubility, a function of temperature, varies from about 0.008% oxygen at 700° C. to about 0.03% at 900° C. Graphs, tables, micrographs. 16 ref. (N12)

208-N. Growth and Surface Properties of Tantalum Crystals. M. H. Nichols. *Physical Review,* v. 94, ser. 2, Apr. 15, 1954, p. 309-313.

Method consists of moving temperature gradient for producing centimeter-long crystals in commercial tantalum wire. Photographs, diagrams, table, micrographs. 15 ref. (N12, P10, Ta)

209-N. Experimental Study of the Variation of the Degree of Order With Temperature in a Copper-Palladium Alloy. D. Madoc Jones and E. A. Owen. *Physical Society, Proceedings,* v. 67, no. 412B, Apr. 1, 1954, p. 297-303.

X-ray study of alloy Cu_3Pd, with reference to variation of degree of order with temperature as revealed by degree of tetragonality at different temperatures. Graphs, table. 2 ref. (N10, Cu, Pd)

210-N. (English.) **The Practical Use of a Three-Dimensional Weichelt Diagram for Alloyed Cast Iron.** Ant. W. van den Bergh. *Metalen,* v. 9, no. 7, Apr. 15, 1954, p. 103-106.

Diagram shows influence of silicon on graphitization of cast iron. Graphs. 11 ref. (N8, Si, CI)

211-N. (Russian.) **Diffusion of Cobalt, Chromium, and Tungsten in Iron and Steel.** P. L. Gruzin. *Doklady Akademii Nauk SSSR,* v. 94, no. 4, Feb. 1, 1954, p. 681-684.

Temperature dependence of diffusion coefficient in alpha and gamma phases of commercial iron and steel. Eutectoid composition in temperature range between 700 and 1250° C. Tables, graphs. 6 ref. (N1, Co, Cr, W, Fe, ST)

212-N. (Russian.) **Influence of Elements Forming Slightly Soluble Carbides on the Dissociation of Austenite.** L. I. Kogan and R. I. Entin. *Doklady Akademii Nauk SSSR,* v. 94, no. 4, Feb. 1, 1954, p. 693-696.

Kinetics of dissolution of titanium, columbium and vanadium additions and their influence on stability of austenite during heat treatment. Table, graphs. 4 ref. (N8, AY)

213-N. (Russian.) **Diffusion of Silver in Iron-Palladium Alloys and Internal Adsorption of Palladium in Iron.** V. I. Arkharov and B. A. Iunikov. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1057-1060 + 1 plate.

Intercrystalline character of diffused silver. Micrographs. 5 ref. (N1, Ag, Fe, Pd)

214-N. (Russian.) **Formation of Graphite in Cast Irons Modified by Magnesium.** K. P. Bunin and Iu. N. Taran. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1061-1063.

Influence of austenitic structure on shape of graphite particles. Micrographs. 5 ref. (N8, CI, Mg)

215-N. (Russian.) **Dissolving and Adsorption of Hydrogen by Dispersed Palladium-Silver Alloys.** Zh. L. Vert and I. P. Tverdovskii. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 2, Feb. 1954, p. 317-327.

Solubility of hydrogen at room temperature decreases uniformly according to increased silver content and reaches zero in alloys with 72 to 75% silver. Tables, graphs. 21 ref. (N12, Ag, Pd)

216-N. Interpretation of the Solubility of Hydrogen in Zirconium. S. L. H. Martin and A. L. G. Rees. *Faraday Society, Transactions,* v. 50, Apr. 1954, p. 343-352.

Pressure and temperature dependence. Effects of oxygen on initial solubility. Graphs. 13 ref. (N12, Zr)

217-N. Diffusion and Oxidation of Solid Metals. C. E. Birchenall. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 893-898.

Review of literature. 90 ref. (N1, R2)

218-N. Formation of Martensite in Austenitic Stainless Steels. Effects of Deformation, Temperature, and Composition. Tryggve Angel. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 165-174 + 1 plate.

Isothermal formation induced by plastic deformation studied in temperature range −188 to 100° C. Graphs, table, micrographs, diagram. 32 ref. (N8, Q24, SS)

219-N. Heat-Treatment of High-Speed Steel. V. Transformations on Tempering of High-Speed Steel. S. G. Cope. *Metal Treatment and Drop Forging,* v. 21, May 1954, p. 225-233.

Characteristics resulting from tempering after normal, arrested and subzero quenching. Graphs, table, micrographs. 18 ref. (N8, J29, TS)

220-N. (Czech.) **Graphitic Steel.** Vaclav Oliverius. *Slévarenstvi,* v. 2; *Prace Ceskoslovenského Vyzkumu Slévarenskénho,* v. 1, no. 2, Feb. 1954, p. 13-20.

Effect of composition and heat treatment on graphitization, mechanical properties and resistance to wear. Tables, graphs, micrographs, photograph. 19 ref. (N8, Q general, ST)

221-N. (Russian.) **Unique Texture of Growth Originating During Diffusion in Se-Cu and Te-Cu Systems.** V. I. Arkharov and Sabir Mardeshev. *Doklady Akademii Nauk SSSR,* v. 95, no. 3, Mar. 21, 1954, p. 517-519 + 1 plate.

Sealed, evacuated ampoules containing copper in upper part and fine selenium or tellurium powder in lower part were heated to 600° C. and held from 2 to 20 hr. for X-ray study of crystal growth. Photographs, micrographs. 3 ref. (N1, Se, Cu, Te)

222-N. (Russian.) **The Form of Temper Carbon Inclusions in Magnesium Cast Iron.** K. P. Bunin and A. V. Chernovol. *Doklady Akademii Nauk SSSR,* v. 95, no. 4, Apr. 1, 1954, p. 785-787.

White iron annealed at 850, 950 and 1050° C. Structure of metal matrix determines form of graphite inclusions. Micrographs. 6 ref. (N8, CI)

223-N. (Russian.) **Solubility of Iron in Liquid Slags.** P. M. Shurygin and O. E. Esin. *Doklady Akademii Nauk SSSR,* v. 95, no. 5, Apr. 11, 1954, p. 1043-1045.

Formation of true solution of iron in oxide slags shown by formation of gold-iron alloys when a drop of gold is introduced into molten FeO-Fe_2O_3 mixture in magnesite crucibles. (N14, Fe)

224-N. (Russian.) **Sintering, Creep, Relaxation, Recrystallization, and Other Phenomena Connected With Self Diffusion in Crystalline Bodies.** B. Ia. Pines. *Uspekhi Fizicheskikh Nauk,* v. 52, no. 4, Apr. 1954, p. 501-559.

Influence of plastic deformation on recrystallization. Creep of amorphous bodies. Diagrams, graphs, tables, micrographs. 36 ref. (N1, N5, Q24)

225-N. Phenomena Observed in the Melting and Solidification of Germanium. S. E. Bradshaw. *Electrochemical Society, Journal,* v. 101, June 1954, p. 293-297.

Molten spheres, weighing about 10 mg., are pear-shaped on freezing. Solidification mechanism to explain shape and impurity distribution. Graphs, photograph. 13 ref. (N12, Ge)

226-N. Diffusion in Bimetal Vapor-Solid Couples. R. W. Balluffi and L. L. Seigle. *Journal of Applied Physics,* v. 25, May 1954, p. 607-614.

Alpha brass, copper-nickel and silver-gold systems. Use and limitations of couples in diffusion studies. Micrographs, graphs, diagram, table. 16 ref. (N1, Cu, Ni, Ag, Au)

227-N. Cross Section of Pulled Crystals. Robert G. Pohl. *Journal of Applied Physics,* v. 25, May 1954, p. 668-669.

Equation for radius of a crystal grown by Czochralski technique. Considers mechanical and thermal equilibrium at liquid-solid interface. 6 ref. (N12)

228-N. (English.) **Precipitation in Lead-Tin Alloys.** T. J. Tiedema and W. G. Burgers. *Applied Scientific Research,* v. 4, sec. A, no. 4, 1954, p. 243-248 + 5 plates.

For slow rates of precipitation the resulting fine-grained material shows a texture related to orientation of original single crystal lattice. Graphs, micrographs, photographs. 6 ref. (N7, Sn, Pb)

229-N. (English.) **Nucleation of a Solid Precipitate Along a Dislocation.** Josef Nyström. *Applied Scientific Research,* v. 4, sec. A, no. 4, 1954, p. 266-272.

Different mobilities and sizes of atoms in the alloy give rise to different possibilities of growth of nuclei. 12 ref. (N2, Au, Ni, Cu, Zn, Be)

230-N. (English.) **The Production of Single Crystals of Metals and Alloys With Any Desired Orientation by Solidification at High Temperature.** Hideo Takaki, Shigeo Nakamura, Yoji Nakamura, Jun-ichi Hayashi, Kazuo Furukawa and Masato Aso. *Physical Society of Japan, Journal,* v. 9, no. 2, Mar.-Apr. 1954, p. 204-208.

Vacuum furnace and porcelain crucibles with no bottom are used to grow crystals with high melting points. Graphs, table, diagrams. 6 ref. (N12)

231-N. (German.) **Application of a Theory of Borelius, Concerning the Structural Connection Between the Solid and the Liquid State, to Iron.** O. Krisement and F. Wever. *Applied Scientific Research,* v. 4, sec. A, no. 4, 1954, p. 249-265.

Applies hypothesis to alpha and gamma iron. Agreement with experimental results. Tables, graphs. 14 ref. (N12, Fe)

232-N. (German.) **The Segregation of Carbon From Alpha Iron.** O. Krisement. *Arkiv för Fysik,* v. 7, no. 4, 1954, p. 353-355.

Calorimetric measurements to determine temperature range in which precipitation of Fe_3C is replaced by precipitation of other carbides. Table, graphs. 4 ref. (N7, Fe)

233-N. (Russian.) **Influence of Additives on Velocity of Contact Exchange Between Iron and Copper.** L. I. Antropov. *Zhurnal Prikladnoi Khimii,* v. 27, no. 5, May 1954, p. 527-532.

Velocity of contact displacement of copper by iron reduced by adding thiourea. Graphs. 9 ref. (N12, Cu, Fe)

234-N. (Book.) **Crystal Growth and Dislocations.** Ajit Ram Verma. 182 p, 1953. Butterworths Scientific Publications, Ltd., 4-6 Bell Yard, Temple Bar, London W.C.2, England. 30s.

A literature review supplemented by results of author's work on spiral growths, as examined by multiple-beam interferometry and phase-contrast microscopy. Methods and apparatus. (N12, M26)

235-N. A Note on the Use of Indium for Removal of Mercury Vapor in Vacuum Systems. R. D. Heyding and E. A. Flood. *Canadian Journal of Chemistry,* v. 32, June 1954, p. 591-592.

Indium adsorbs mercury vapor quite rapidly after a short induction period. Table. (N15, In)

236-N. The Isothermal Heat Treatment of High Speed Steels and Its Effects in the Light of Recent Structure Research. H. Schrader and D. R. Dhanbhoora. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 54-93; disc., p. 94-95.

Possible alterations in composition and dependence on alloy and carbon content of steel, annealing period in pearlitic range and in holding time in bainitic range and resulting influences. Tables, graphs, diagrams, micrograph. 27 ref. (N8, J26, TS)

237-N. Impurities as Hindrances to Grain Boundary Migration. V. G. Paranjpe. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 203-218.

Detailed mechanisms and supporting evidence applicable to commercial heat treating processes involving recrystallization and grain

growth. Photographs, diagrams, graph, table. 28 ref.
(N3, N5, J general)

238-N. The Structure of Eutectics. V. Chandrasekhar. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 243-266.
Critical review of existing knowledge on genesis of eutectic structures, influence of supercooling, proeutectic constituent, rate of cooling and liquid currents. Tables, micrographs, graph. 25 ref. (N12)

239-N. Studies on the Grain Growth of Alpha Brass. S. C. Som and G. P. Chatterjee. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 267-271; disc., p. 271-273.
Some fundamental concepts on growth as a function of time and temperature under a known temperature-gradient condition. Graphs. 5 ref. (N3, Cu)

240-N. Isothermal Transformations of Hypo-Eutectoid Aluminium Bronzes. R. Haynes. *Insitute of Metals, Journal,* v. 82, June 1954, p. 493-496 + 1 plate.
Effect of small additions of nickel to a binary hypo-eutectoid alloy. Table, graphs, micrographs. 12 ref. (N9, Al, Cu)

241-N. Solid Solubility of Oxygen in Columbium. A. U. Seybolt. *Journal of Metals,* v. 6, June 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, June 1954, p. 744-776.
Solubility limit in range between 775 and 1100° C. by lattice parameter measurements and microscopic examination. Solubility varied from 0.25 to 1.0%. Tables, graphs, micrographs. (N12, Cb)

242-N. Vibrational Spectrum of the Simplest Model of an Ordering Alloy. A. N. Men and A. N. Orlov. *National Science Foundation Translation, no.* 160, Jan. 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 753-756.)
Linear chain of two types of atoms distributed over nodes of the chain with an arbitrary degree of long-range order and with arbitrary relative concentration which interact elastically. 5 ref. (N10, Au, Cu)

243-N. The Diffusion of Nitrogen in Alpha Iron. W. R. Thomas and G. M. Leak. *Philosophical Magazine,* v. 45, 7th ser., no. 365, June 1954, p. 656-659.
Measurements of diffusion in temperature range of 0 to 100° C. Graphs, table. 6 ref. (N1, Fe)

244-N. Nucleation and Growth of Graphite in Steel. Floyd Brown. *Welding Journal,* v. 33, June 1954, p. 257S-261S.
Reaction rates and effects of alloying elements. Tables, diagram, graphs, micrographs. 9 ref.
(N2, N3, ST)

245-N. Transformation of Austenite During Continuous Cooling. A. A. Popov. *Henry Brutcher, Altadena, Calif., Translation no.* 3089, 31 p. (Part translation from book by I. N. Bogachev and A. A. Popov, Entitled "Phase Transformations in Iron-Carbon Alloys", Mashgiz, 1950, p. 136-159.)
Austenite decomposition diagrams for continuous cooling at various rates, applying to hypo-eutectic and hypereutectic carbon steels and to alloy steels differing in the stability of the supercooled austenite, especially at second-stage temperatures. Tables, graphs. 3 ref. (N8, CN, AY)

246-N. Effect of Surface-Active Compounds Upon the Diffusion of Hydrogen Into Iron and the Mechanism of Hydrogen Overvoltage. I. A. Bagotskaya and A. N. Frumkin. *Henry Brutcher, Altadena, Calif., Translation no.* 3253, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 92, no. 5, 1953, p. 979-982.)
Transfer of hydrogen overvoltage through a membrane of spectrographically pure iron, with simultaneous measurement of the quantity of hydrogen diffusing through it during cathodic polarization in pure 1*N* HC1 solutions and in the presence of an inhibitor. Graphs, diagram. (N1, Fe)

247-N. On the Nature of Eutectic Graphite in Gray Iron. K. P. Bunin and L. A. Dolinskaya. *Henry Brutcher, Altadena, Calif., Translation no.* 3131, 8 p. (From *Liteinoe Proizvodstvo,* v. 4, no. 3, 1953, p. 21-23.)
Mechanism of crystallization of fine "eutectic" graphite. Photographs, micrographs. 3 ref.
(N12, CI)

248-N. Principles of Solution Hardening. Earl R. Parker and Thomas H. Hazlett. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 30-70.
Mechanisms of hardening, contribution of clustering, factors influencing solution hardening. Graphs, diagrams. 44 ref. (N7, J27)

249-N. Theories of Dispersion Hardening. Edward W. Hart. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 95-107.
Comparison of theories with experience. Diagrams, graphs. 11 ref.
(N7, J27)

250-N. Interactions of Dislocations and Solute Atoms. A. H. Cottrell. Paper from "Relation of Properties

to Microstructure". American Society for Metals, p. 131-162.

Types of interactions and their effects. Tables, graphs, diagrams, micrograph. 75 ref. (N12, M26)

251-N. (English.) **Transformation Mechanism of Low Chromium Steel With High Carbon at the Range of Ar″ Transformation Temperature.** Kenji Ono and Tadashi Nemoto. *Hitachie Review*, 1954, no. 5, Feb., p. 31-38.

Transformation processes of chromium and chromium-molybdenum steels investigated by means of magnetic analysis. Tables, diagram, graphs. 4 ref. (N8, AY)

252-N. (French.) **New Example of Discontinuous Precipitation on Grain Boundaries of Aluminum-Manganese Alloys.** André Robillard and Paul Lacombe. *Comptes rendus*, v. 238, no. 18, May 3, 1954, p. 1814-1816.

Mechanism of "light phenomenon" of tempered supersaturated solid solutions. Micrographs. (N7, Al, Mn)

253-N. (French.) **Evolution of the Structure of 80-20 Nickel-Chromium Alloys Susceptible to Structural Hardening, Studied Under X-Rays.** Jack Manenc. *Comptes rendus*, v. 238, no. 18, May 13, 1954, p. 1817-1819.

X-ray crystal analysis reveals a homogeneity disturbance of solid solution prior to precipitation visible under the electron microscope. Radiogram. 7 ref. (N7, M22, Ni)

254-N. (French.) **Grain Growth Observed by Electron-Emission Microscope.** G. W. Rathenau and G. Bass. *Métaux, Corrosion-Industries*, v. 29, no. 344, Apr. 1954, p. 139-150.

Recrystallization of nickel and iron alloys during transformation. Micrographs, diagram, graph. 16 ref. (N3, N5, M22, Ni, Fe)

255-N. (French.) **Research on Formation of Large Heterogeneous Crystals in Light Alloys Containing Chromium.** Jean Chinetti. *Métaux, Corrosion-Industries*, v. 29, no. 344, Apr. 1954, p. 151-166.

Solubility limit of chromium in aluminum-chromium-manganese alloys at 662° C. Tables, micrographs, diagram, graphs. 8 ref. (N12, Al, Cr, Mn)

256-N. (French.) **The Metallography of Stressed and Unstressed Pure Zinc at Elevated Temperatures.** P. J. E. Forsyth. *Revue de métallurgie*, v. 51, no. 5, May 1954, p. 326-336.

Grain growth, grain-boundary formation and recrystallization. Micrographs, diagrams, photographs. 3 ref. (N3, N5, M27, Zn)

257-N. (German.) **Determination of Some Diffusion Coefficients of Metals in Quicksilver Using the Mercury Drop-Electrode.** M. v. Stackelberg and V. Toome. *Zeitschrift für Elektrochemie*, v. 58, no. 4, 1954, p. 226-230.

Diffusion coefficients of cadmium, indium, lead and sodium in mercury at 22° C. Tables, graphs. 14 ref. (N1, Co, In, Pb, Hg)

258-N. (Polish.) **Relation Between Curves of Isothermal Austenite Transformation and Temperature of Austenite Transformation During Continuous Cooling.** Marian Kozlowski. *Hutnik*, v. 21, no. 3, Mar. 1954, p. 66-72.

Comparison of calculation with experimental results. Advantages derived from knowledge of course of curves. Graphs. 3 ref. (N8, AY)

259-N. **Modification of High-Silicon Aluminium Alloys and the Corresponding Structures.** Claude Mascré. *Institute of British Foundrymen, Proceedings*, v. 46, 1953, p. A227-A232; disc., p. A232-A235. (Translated from the French by V. C. Faulkner.)

Action of phosphorus and sodium on grain refinement and resulting mechanical properties. Photomicrographs, graphs, diagrams, table. 6 ref. (N5, Q general, Al, Si)

260-N. **Annealing of White Irons. Structural Changes With Metals of High S:Mn Ratios.** Axel Hultgren and Gustaf Ostberg. *Iron & Steel (Special Issue)*, v. 27, June 12, 1954, p. 272-282; disc., p. 327-332.

Effect of annealing variables and S:Mn ratio on type of graphite structure of cementite and austenite, and transformation of manganese sulfide. Tables, graphs, micrographs. (N8, J23, CI)

261-N. **Cementite in Cast Iron. Decomposition During Solidification.** A. Berman and V. Kondic. *Iron & Steel (Special Issue)*, v. 27, June 12, 1954, p. 283-284; disc., p. 327-332.

Graphitization at different cooling rates. Decomposition of cementite at temperatures below the eutectic. Graphs, tables, micrograph. (N8, CI)

262-N. **The Growth of Nodular Graphite. Theory of Screw Dislocation.** M. Hillert and Y. Lindblom. *Iron & Steel (Special Issue)*, v. 27, June 12, 1954, p. 295-296; disc., p. 327-332.

Theory examined by activation analysis and autoradiography using radioactive isotopes in mischmetal. Photograph, diagram, table. (N8, M23, CI)

263-N. **Undercooled Graphite. Formation in Cast Irons and Related Al-**

loys. H. Morrogh and W. J. Williams. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 302-304; disc., p. 327-332.

Undercooled graphite in cast irons, iron-carbon-silicon alloys and iron-carbon alloys arises from the decomposition of a carbide. Micrographs, tables. (N8, CI, Fe)

264-N. Solidification of Fe-P-C Alloys. H. Morrogh and P. H. Tütsch. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 304-305; disc., p. 327-332.

Additions of phosphorus to iron-carbon alloys profoundly modified the usual ledeburitic structures. Table, diagram, micrographs. (N12, CI)

265-N. The Solidification of Nodular Iron. H. Morrogh. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 310-313; disc., p. 327-332.

Cooling curve experiments. Tables, micrographs. (N12, CI)

266-N. Diffusion of Nitrogen in Iron. J. D. Fast and M. B. Verrijp. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 313-314.

Diffusion coefficients at 9.5, 21.5, 500, 600 and 950° C. Graphs, tables. (N1, Fe)

267-N. Transformation Diagrams. Continuous-Cooling Curves of Steels. W. Steven and G. Mayer. *Iron & Steel (Special Issue),* v. 27, June 12, 1954, p. 317-321.

Progress with temperature of the transformations that occur in bars up to 6 in. diameter when quenched in oil under standard conditions. Graphs, table. (N8, CN)

268-N. The Strain Ageing of Mild Steel. A Critical Investigation of the Ageing of Mild-Steel Strip After Temper-Rolling. B. Jones and R. A. Owen-Barnett. *Iron and Steel Institute, Journal,* v. 177, June 1954, p. 209-220.

Aging of steels at room temperature for periods up to 3 yr. compared with artificial aging at temperatures of 100 to 250° C. Tables, graphs. 20 ref. (N7, J27, CN)

269-N. Order-Disorder Phenomena. Bruno Linder. *Journal of Chemical Physics,* v. 22, June 1954, p. 970-973.

Thermodynamics of the order-disorder transition in beta brass. Graph. 9 ref. (N10, Cu)

270-N. Isothermal Transformation of Austenite in the Pearlite Range From the Carburizing Temperature. H. M. Meingast. *Henry Brutcher, Altadena, Calif., Translation no.* 2862, 5 p. (Condensed from *Durferrit Hausmitteilungen,* 1952, no. 25, p. 5-44.)

Particulars on two heat treatment stages which arise during case carburizing, transformation of core and case structures of steel cooled in pearlite range from carburizing temperature and martempering of case carburizing steels. Graphs, diagrams. (N8, AY)

271-N. Transformations During the Tempering of Steel. V. G. Permyakov. *Henry Brutcher, Altadena, Calif., Translation no.* 3084, 22 p. (Part from Book "Phase Transformations in Iron-Carbon Alloys", I. N. Bogachev and A. A. Popov, p. 160-174, 1950. Mashgiz, Moscow, USSR.)

Amounts of carbon precipitated per unit time from martensite during heating of quenched high, medium and low-carbon steels. Effect of alloy content of steel on carbide formation during tempering. Graphs. 5 ref. (N8, J29, CN, AY)

272-N. On the Structure of the Austenite-Graphite Eutectic in Gray Iron. K. P. Bunin, Ya. N. Malinochka and S. A. Fedorova. *Henry Brutcher, Altadena, Calif., Translation no.* 3199, 3 p. (From *Liteinoe Proizvodstvo,* v. 4, no. 9, 1953, p. 25.)

Grains of fine austenite-graphite eutectic, which formed under conditions of marked supercooling of the melt, may consist of an austenitic matrix intergrown with a single strongly branched-out graphite inclusion that grows from a single center during eutectic decomposition. Micrographs. 6 ref. (N8, CI)

273-N. Structure of Austenite at High Temperature. I. A. Oding and M. G. Lozinskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3274, 18 p. (From *Izvestiya Akademii Nauk SSSR, OTN,* 1953, no. 7, July, p. 1035-1043.)

Previously abstracted from original. See item 29-N, 1954. (N8, ST)

274-N. Aluminum and Gas. I-IV. H. Kostron. *Henry Brutcher, Altadena, Calif., Translation nos.* 3276-3279, 84 p. (From *Zeitschrift für Metallkunde,* v. 43, no. 8, 1952, p. 269-284, 373-387.)

Previously abstracted from original. See item 304-N, 1952. (N12, N1, Al)

275-N. Heats of Disintegration in the Diffusion of Boron Into Tungsten and Molybdenum Metal. G. V. Samsonov. *Henry Brutcher, Altadena, Calif., Translation no.* 3285, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 93, no. 5, 1953, p. 859-861.)

Previously abstracted from original. See item 193-N, 1954. (N1, P12, W, Mo, B)

276-N. State of Martensite Crystals in Quenched Low-Carbon Steels. G. V. Kurdyumov, M. D. Perkas and A. E. Shamov. *Henry Brutcher, Altadena, Calif., Translation no.* 3295, 7 p. Also *National Science Foundation Translation, no.* 224, Feb., 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 92, no. 5, 1953, p. 955-957.)

Previously abstracted from original. See item 120-N, 1954. (N8, CN)

277-N. Effect of Silicon on the Rate of Diffusion of Carbon in Austenite. M. A. Krishtal. *National Science Foundation Translation, no.* 223, Feb. 1954, 3 p. (From *Doklady Akademii Nauk SSSR,* v. 92, 1953, p. 951-953.)

Previously abstracted from original. See item 119-N, 1954. (N1, N8, Si, AY)

278-N. (English.) **Precipitation Out of Dual Solid Solutions of Carbon and Nitrogen in Alpha-Iron.** C. Wert. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 361-367.

Kinetics of dual precipitation studied by internal friction. Interaction tends to produce equal aging rates. Particle size effect makes magnetic data hard to interpret. Graphs. 15 ref. (N7, Q22, Fe)

279-N. (English.) **Accelerated Growth of Tin Whiskers.** R. M. Fisher, L. S. Darken and K. G. Carroll. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 368-373.

Growth rate may be accelerated up to 10,000 times the previously observed spontaneous rate by the application of pressure up to 7500 psi. Photographs, graphs. 8 ref. (N12, Sn)

280-N. (English.) **On the Theory of Secondary Recrystallization Texture Formation in Face-Centered Cubic Metals.** C. G. Dunn. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 386-393.

An oriented-nucleation growth-selectivity theory. Diagrams, tables. 25 ref. (N5, Cu, Al)

281-N. (English.) **Secondary Recrystallization in Aluminium Extrusions.** K. V. Gow. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 394-405.

Crystallographic orientations of recrystallized grains in a series of extruded and heat treated rods of commercial and superpure aluminum. Tables, micrographs, diagrams. 19 ref. (N5, Al)

282-N. (English.) **The Effect of Relative Crystal and Boundary Orientations on Grain Boundary Diffusion Rates.** D. Turnbull and R. E. Hoffman. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 419-426.

Rate of self-diffusion of silver in the grain boundaries of bicrystals. Graphs, photographs, tables. 16 ref. (N1, Ag)

283-N. (English.) **Activity of Silicon in Liquid Fe-Si and Fe-C-Si Alloys.** J. Chipman, J. C. Fulton, N. Gokcen and G. R. Caskey, Jr. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 439-450.

Experimental data establishing solubility of graphite at temperatures of 1290 to 1690° C. in iron-silicon-carbon solutions up to 20 to 24 wt. % silicon. Tables, graphs. 28 ref. (N12, P12, Si, Fe)

284-N. (English.) **The Ordering of Atoms in the Chi-Phase of the Iron-Chromium-Molybdenum System.** J. S. Kasper. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 456-461.

Crystal structure investigated by X-ray and neutron diffraction from powdered specimens. Tables, diagram. 3 ref. (N10, Fe, Cr, Mo)

285-N. (English.) **Some Observations on Heterogeneous Nucleation of Sodium Crystals From Atomic Beams.** L. Yang, C. E. Birchenall, G. M. Pound and M. T. Simnad. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 462-469.

Deposition from sodium vapor beams studied as function of temperature and lattice misfit between the body-centered cubic sodium crystal and the various crystalline substrates. Tables, graphs. 22 ref. (N2, Na)

286-N. (English.) **A Radioactive Tracer Study of Silver Condensation on Substrates.** Ling Yang, M. T. Simnad and G. M. Pound. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 470-475.

Condensation coefficients of silver vapor on substrates of silver, gold, platinum, nickel and glass at 192° C. with time of condensation fixed at 1 hr. Diagram, graphs, tables. 10 ref. (N16, Ag)

287-N. (English.) **The Effect of Phase Transformations on the Orientation of Zirconium Crystals.** J. W. Glen and S. F. Pugh. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 520-529.

Orientation relations suggested by Burgers for the phase change in zirconium used to deduce possible orientations which can arise after one or two transformations starting from either a hexagonal or a body-centered-cubic lattice. Diagrams, tables. 11 ref. (N6, M26, Zr)

288-N. (English.) **Self-Diffusion in Lead.** B. Okkerse. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 551-553.

Lattice and grain-boundary diffusion and effect of impurities. Graphs. 11 ref. (N1, Pb)

289-N. (French.) **Influence of Impurities on Secondary Recrystallization of Soft Iron.** Roger Guihaumé. *Comptes rendus,* v. 238, no. 21, May 24, 1954, p. 2085-2086.

Role of impurities during grain growth of Armco and Ugiperval iron. 6 ref. (N5, N3, Fe)

290-N. (French.) **The Simultaneous Observation of Polygonization and Recrystallization During Annealing of the Surface Layers of Abraded Alpha Brass.** Pierre A. Jacquet. *Comptes rendus,* v. 238, no. 22, May 31, 1954, p. 2165-2167.

Observation of phenomena during grinding. Micrographs. 5 ref. (N5, Q24, Cu)

291-N. (French.) **Effect of Cold Hardening After Tempering on the Phenomena of Pre-Precipitation in Aluminum-Copper Alloy With 4% Copper.** René Graf and André Guinier. *Comptes rendus,* v. 238, no. 22, May 31, 1954, p. 2175-2177.

X-ray study on development of Guinier-Preston zones and precipitation. Table. 5 ref. (N7, Al, Cu)

292-N. (German.) **Contribution to the Formation of Spherical Graphite in Cast Iron.** Borut Marincek. *Giesserei,* v. 41, no. 12, June 10, 1954, p. 313-320.

Effect of surface tension on graphite crystallization. Graphs, diagrams. 36 ref. (N8, CI)

293-N. (German.) **Eutectic Crystallization.** Erich Scheil. *Zeitschrift für Metallkunde,* v. 45, no. 5, May 1954, p. 298-309.

Probability of various structures depending on specific volumes of two pure substances and concentrations of both kinds of crystals. Tables, micrographs, graphs. 30 ref. (N12)

294-N. (Russian.) **Effect of Austenite Grain Size Upon Martensite Transformation in Steel.** M. G. Gaidukov and V. D. Sadovskii. *Doklady Akademii Nauk SSSR,* v. 96, no. 1, May 1, 1954, p. 67-68 + 1 plate.

Breaking down of austenite grains caused by formation of slippage planes during deformation should show an effect similar to lowering of temperature. Table, micrographs. 7 ref. (N8, ST)

295-N. (Russian.) **Solubility of Chemical Elements in Titanium.** I. I. Kornilov. *Izvestiia Akademii Nauk SSSR, Otdelenie Khimicheskikh Nauk,* 1954, no. 3, May-June, p. 392-399.

Effects of atomic diameters on formation of solid solutions. Tables, graphs. 38 ref. (N12, Ti)

296-N. (Russian.) **Investigation of Structural Changes in Iron-Nickel-Aluminum Alloys by Method of True Heat Capacity.** V. A. Troshkina and K. G. Khomiakov. *Zhurnal Obshchei Khimii,* v. 24, no. 5, May 1954, p. 780-790.

Causes of high coersive state and structural changes arising in process of magnetic hardening. Graphs, tables, diagram. 12 ref. (N6, M23, Fe, Ni, Al)

297-N. Transformations in Steels—Isothermal and During Continuous Cooling. G. P. Contractor and V. G. Paranjpe. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 141-144; disc., p. 144-145.

Method of correlating isothermal and continuous cooling transformations. Qualitative results can be deduced by this method but it does not give good quanitative agreement in all steels. 5 ref. (N8, ST)

298-N. Bainite Reactions in Steels. V. G. Paranjpe and D. D. Kaushal. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 147-172.

Critical review of existing knowledge. Attention drawn to some aspects of this reaction not yet well understood. Graphs, micrographs. 61 ref. (N8, ST)

299-N. Interaction of Hydrogen With White Cast Iron. P. C. Ghosh and B. Chatterjee. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 215-224; disc., p. 224-225.

Mechanism of interaction between hydrogen and alloys of iron, carbon, sulphur and phosphorus. Graph, diagram, tables. 20 ref. (N1, CI)

300-N. Theories of Graphite Formation in Nodular Cast Irons. M. N. Parthasarathi, B. S. Srikantiah and B. R. Nijhawan. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 227-242; disc., p. 243.

Literature review. Theories to explain nodular-graphite formation in irons treated with magnesium, cerium etc. Micrographs, diagram. 31 ref. (N8, CI)

301-N. Sigma Phase—a Review. Adolph J. Lena. *Metal Progress,* v. 66, July 1954, p. 86-90.

Formation and extent of sigma phase in ferritic and austenitic stainless steels. Micrographs, phase diagrams. (N6, M26, SS)

302-N. Formation of Graphite Nodules. Albert De Sy. *Metal Progress,* v. 66, July 1954, p. 92-93.

Mechanism of solidification of nodular iron. Diagrams, micrograph. (N12, CI)

303-N. Diffusion of Impurities in Germanium. W. C. Dunlap, Jr. *Physical Review,* v. 94, sr. 2, June 15, 1954, p. 1531-1540.

Diffusion of impurities in semiconductors studied by observation of *p-n* junction formed as the diffusing impurity penetrates the specimen. Graphs, diagrams. 10 ref. (N1, Ge)

304-N. (French.) **Micrographic Structure of Steel and Brittleness Due to Hydrogen.** Paul Bastien and Pierre Amiot. *Comptes rendus,* v. 238, no. 23, June 9, 1954, p. 2238-2239.

Hydrogen was introduced into chromium-molybdenum steel by electrolysis so that quantity of gas diffused was nearly the same in all cases. Effects of hydrogen on mechanical properties. Table. 2 ref. (N1, Q general, AY)

305-N. (German.) **Considerations of Age Hardening.** F. Rohner. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 5, May 1954, p. 157-159.

Review of various theories. (N7)

306-N. (Russian.) **Solubility of Oxygen in Fusions of Iron, Chromium and Nickel.** S. V. Bezobrazov and A. M. Samarin. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 12, Dec., p. 1790-1797.

Equilibrium between water vapor-hydrogen atmosphere and molten chromium-nickel alloys. Nature of oxide formed. Tables, graphs. 3 ref. (N12, Fe, Ni, Cr)

307-N. (Russian.) **The Nature of Laminar Graphite.** D. P. Ivanov. *Liteinoe Proizvodstvo,* 1954, no. 3, May-June, p. 18-24.

Structure, amount and nature of graphite distribution in basic metallic mass. Theories of graphitization. Micrographs. (N8, CI)

308-N. (Russian.) **The Graphitization of Pure Iron-Carbon Alloys.** K. P. Bunin and T. M. Shpak. *Liteinoe Proizvodstvo,* 1954, no. 3, May-June, p. 26-27.

Experimental study shows graphite forms in pores existing in the initial white iron. Micrographs. (N8, CI)

309-N. Reactions at Solid Interfaces. F. C. Tompkins and D. A. Young. *The Chemical Society, Annual Reports,* v. 50, 1953, p. 70-80.

Current developments on solid decompositions. Nucleus formation and growth; decompositions of specific compounds. 117 ref. (N2, N3, P13)

310-N. Anisothermal Decomposition of Austenite in a Medium-Alloy Steel. P. T. Moore. *Iron and Steel Institute, Journal,* v. 177, July 1954, p. 305-311.

Studies were made by the "step-quench" and continuous-cooling methods to check validity of the Scheil "fractional nucleation" theory and its modifications. Graphs, tables. 16 ref. (N8, AY)

311-N. Carbides in 310 Stainless Steel. I. Hiram Brown. *Steel,* v. 135, July 19, 1954, p. 106-108.

Formation of chromium carbide networks around grain boundaries during rolling or fabrication. Effects on cracking during hot working. Micrographs, tables. (N8, F23, SS)

312-N. (French.) **Formation of Carbides in Bainitic Transformation of Steel.** Jacques Pomey. *Comptes rendus,* v. 238, no. 24, June 14, 1954, p. 2318-2320.

Effect of speed of isothermal decomposition of austenite into bainite. Graphs. 1 ref. (N8, ST)

313-N. (French.) **The Effect of Carbon on the S-Curves of Steels of the CD4 Type.** G. Meynet. *Revue de métallurgie,* v. 51, no. 6, June 1954, p. 365-378.

Dilatometric and micrographic studies of low-alloy steels. Table, graphs, micrographs. (N8, AY)

314-N. (French.) **The Thermodynamics of Austenite-Martensite Transformation in Iron-Carbon Alloys.** O. Krisement, E. Houdremont, and F. Wever. *Revue de métallurgie,* v. 51, no. 6, June 1954, p. 401-409; disc. p. 410.

Formation of martensite studied to determine persistence of austenite. Graphs, diagram. 9 ref. (N8, P12, ST)

315-N. (French.) **The Diffusion of Addition Elements, in Particular of Copper, Into the Coating of Clad Light Alloys.** M. Renouard. *Revue de métallurgie,* v. 51, no. 6, June 1954, p. 419-424.

Diffusion of copper into coatings of clad duralumin determined spectrographically. Graphs, micrographs. (N1, L22, Cu, Al)

316-N. (French.) **Study of Transformations Occurring During the Tempering of High Speed Steel.** A. H. Michel and J. Papier. *Revue de métallurgie,* v. 51, no. 6, June 1954, p. 425-433; disc., 434.

Causes of contractions observed at 80 to 160° C. and 260 to 360° C. Graphs. 17 ref. (N8, TS)

317-N. (German.) **Effect of Antimony on the Attack of Iron by Molten Zinc Saturated With Iron.** Dietrich Horstmann. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 207-213.

Experiments reveal that laws which apply to pure zinc-iron diffusion apply also to alloys. Tables, graphs, micrographs. 6 ref. (N1, R6, Sb, Fe, Zn)

318-N. (German.) **The Particle Size of Iron Nitride Precipitated From an Alpha-Iron Supersaturated With Carbon and Nitrogen.** Werner Köster and Lothar Bangert. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 231-238; disc., p. 238-240.

Effect of temperature, rate of cooling, and annealing. Graphs, micrographs, diagrams. 24 ref. (N7, Fe)

319-N. (German.) **The Precipitation of Carbon in Alpha-Iron During Aging.** Winfrid Dahl and Kurt Lücke. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 241-249; disc., p. 249-250.

Electrical resistance of undeformed and elongated carbonyl iron wire as functions of aging temperature and time. Graphs, tables. 30 ref. (N7, P15, Fe)

320-N. (German.) **The Decomposition of Austenite in Hypereutectoid Manganese Steels.** Werner Jellinghaus, Adolf Rose, and Hans Holetzko. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 251-261; disc., p. 261-262.

Determination of isotherms of resistance and magnetization, lattice parameters, and nucleation experiments. Graphs, tables, micrographs. 36 ref. (N8, AY)

321-N. (German.) **Basic Considerations on the Transformations of Austenite in the Pearlite and Intermediate Stage.** Werner Jellinghaus and Eduard Houdremont. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 263-269; disc., p. 269-270.

Effect of carbon diffusion, carbide formation, and diffusionless transformation. Graphs, micrograph. 27 ref. (N8, AY)

322-N. (German.) **The Effect of Different Elements on Graphitization and Its Spectroscopic Investigation.** K. Roesch. *Giesserei,* v. 41, no. 13, June 24, 1954, p. 338-340.

Effects of various inclusions in cast iron. Tables, spectrographs. 9 ref. (N8, CI)

323-N. (Russian.) **Effect of Interstitial Atoms on Self-Diffusion of Metals.** M. A. Krivoglaz and A. A. Smirnov. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 495-498.

Theoretical explanation of experimental results obtained by Gruzin, Kornev, and Krudiumov. Graphs. 5 ref. (N1)

324-N. (Russian.) **Problem of Solution of Metals in Their Chlorides.** G. G. Urazov and A. S. Karnaukhov. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 535-538.

Thermal analysis of lead-lead chloride and cadmium-cadmium chloride. Tables, graphs. 3 ref. (N12, Pb, Cd)

325-N. (Russian.) **Reversibility of Martensitic Transformations During Heating of Iron-Carbon Alloys.** V. N. Gridnev and V. I. Trefilov. *Doklady Akademii Nauk SSSR,* v. 96, no. 4, June 1, 1954, p. 741-743.

Relation of phase transformation to rate of heating. Position of critical point for normalized and tempered steels. Graphs. 7 ref. (N8, ST)

326-N. **ABC of Foundry Practice. Fundamentals of Metal Solidification.** T. H. Trevithick. *Foundry,* v. 82, Aug. 1954, p. 224, 226, 228.

Solid solutions and mechanical mixtures. Graphs. (N12)

327-N. **Carbides in 310 Stainless Steel. II.** Hiram Brown. *Steel,* v. 135, July 26, 1954, p. 92-94.

Conditions that cause severe carbide precipitation include annealing temperatures of less than 2050° F. and slow cooling from heat treating temperature. Photographs, micrographs. (N8, SS)

328-N. (French.) **Influence of Deformation in Secondary Recrystallization of Soft Iron.** Roger Guihaumé. *Comptes rendus,* v. 238, no. 25, June 21, 1954, p. 2418-2420.

Orientations and dimensions of secondary crystals vary with rate or cold working. Micrographs. 2 ref. (N5, Fe)

329-N. (French.) **Isothermal Transformations and Heat Treatments of Copper and Nickel-Chromium Cast Irons.** J. van Eeghem, J. Vidts and A. De Sy. *Fonderie,* 1954, June, no. 101, p. 3973-3988; disc., p. 3988.

Methods for determining transformation curves. Tables, graphs, photographs, micrographs. 7 ref. (N8, J28, CI)

330-N. (German.) **Decomposition of the Wustite Phase.** L. Castelliz, W. De Sutter and F. Halla. *Monatshefte für Chemie,* v. 85, no. 3, June 1954, p. 487-490.

Experiments show that significant

amounts of Fe_3O_4 are formed at 190° C. on sheet iron heated in air. 2 ref. (N8, Fe)

331-N. (French.) **Effect of Interstitial Elements on Allotropic Transformation of Cobalt.** Jean Drain, Raymond Bridelle and André Michel. *Bulletin de la société chimique de France,* 1954, no. 6, June, p. 828-830.

Thermal analysis and X-rays reveal effect of hydrogen, nitrogen and carbon on temperature and hysteresis of transformation. Graphs, tables. 20 ref. (N6, Co)

332-N. (French.) **X-Ray Study of Reversion Phenomena in Aluminum-Copper Alloy With 4% Copper.** René Graf and André Guinier. *Comptes rendus,* v. 239, no. 1, July 5, 1954, p. 52-54.

Modified kinetics after reహardening. Study of monocrystalline structures. Effect of reversion on zones and phases. Table. (N6, Al, Cu)

333-N. (French.) **Allotropic Transformation of Cobalt.** Hervé Bibring and Francois Sebilleau. *Comptes rendus,* v. 239, no. 1, July 5, 1954, p. 54-56.

X-ray study. Effect of reheating on cubic and hexagonal phases. Micrographs. (N6, Co)

334-N. (German.) **Preferred Direction of Surface Diffusion on the Surfaces of Monocrystals.** Michael Drechsler. *Zeitschrift für Elektrochemie,* v. 58, no. 5, July 1954, p. 334-339.

Theoretical determination and electron microscopic study on adsorption of barium on tungsten and tungsten on tungsten. Photographs, diagrams. 14 ref. (N1, Ba, W)

335-N. (German.) **Measuring Surface-Diffusion Coefficients and Exchange Energies of Barium on the Surfaces of Monocrystalline Tungsten With the Field-Electron Microscope.** Michael Drechsler. *Zeitschrift für Elektrochemie,* v. 58, no. 5, July 1954, p. 340-345.

Experimental values agree with theoretical determinations. Photographs, diagram, graph, tables. 12 ref. (N1, Ba, W)

336-N. (German.) **Explanation of the Diffusion Process in the Copper-Nickel System.** Wolfgang Seith and Rudolf Ludwig. *Zeitschrift für Metallkunde,* v. 45, no. 6, June 1954, p. 401-407.

Diffusion during welding and in the vapor phase. Study of secondary phenomena. Micrographs, graphs, diagram. 11 ref. (N1, Cu, Ni)

337-N. Annealing of Cold Worked Metals. Paul A. Beck. *Advances in Physics,* v. 3, July 1954, p. 245-324 + 11 plates.

Mechanisms explaining well-annealed condition approached by recovery, subgrain growth and recrystallization. Graphs, tables, diagram. 187 ref. (N4, N5, J23)

338-N. Solubility of Hydrogen in Iron-Carbon Alloys. B. G. Davies and T. Evans. *Foundry Trade Journal,* v. 97, July 29, 1954, p. 115-122.

Equilibrium value of solubility of alloys with up to 3.4% carbon from 600 to 1000° C. at one atmosphere pressure. Diagrams, tables, graphs. 4 ref. (N12, Fe)

339-N. (English.) **The Transformation of the Steels by the Rapid Heating. IV. On the Ac_3 Transformation of the Armco Iron.** Kiyoshi Yokota and Nobuhiro Iguchi. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 44-47.

Determination of mechanism of the transformation by analysis of time-dilatometric curves for rapid rates of heating. Photograph, diagram, graphs. 11 ref. (N8, Fe)

340-N. (English.) **Formation Energy of Superlattice in Ni_3Fe. II. Kinetics of the Superlattice in the Stage of Local Ordering.** Shuichi Iida. *Physical Society of Japan, Journal,* v. 9, no. 3, May-June 1954, p. 346-354.

Change of internal energy of Ni_3Fe superlattice during cooling processes studied by specific heat measurement for various rates of cooling. Graphs. 15 ref. (N10, Ni, Fe)

341-N. (English.) **X-Ray Study of Cold Work in Some Ordered Alloys.** Shoichi Annaka. *Physical Society of Japan, Journal,* v. 9, no. 3, May-June 1954, p. 354-358.

Structure changes due to cold work on polycrystalline specimens of superlattice alloys $AuCu_3$, AuCu, AgCd and AgZn. Tables, graphs. 10 ref. (N10, Au, Cu, Ag, Cd, Zn)

342-N. (English.) **Electron-Diffraction Study of Liquid-Solid Transition of Thin Metal Films.** Mieko Takagi. *Physical Society of Japan, Journal,* v. 9, no. 3, May-June 1954, p. 359-363.

Structure changes of thin films of lead, tin and bismuth at various temperatures. Diagrams, diffraction patterns, graph, tables. 10 ref. (N12, M22, Pb, Sn, Bi)

343-N. (English.) **Several Experiments Concerning the Production of Iron Single Crystals by the Recrystallization Method.** Mikio Yamamoto and Ryofu Miyasawa. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 5, no. 6, Dec. 1953, p. 493-504.

Production of carbon-free iron and strain-annealing techniques. Graphs, tables, micrographs, diagram. 24 ref. (N5, Fe)

344-N. (English.) **Study on High Chromium Steels. II. On the Anomaly of Alpha Solid Solution of Fe-Cr System at High Temperatures.** Yunoshin Imai and Kenzaburo Kumada. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 5, no. 6, Dec. 1953, p. 520-532.

Effects of prolonged heating at 500° C. Tables, graphs. 7 ref. (N6, SS)

345-N. (English.) **Mechanisms for the Development of Martensitic Transformation of a Face-Centered Cubic Structure Into a Body-Centered Tetragonal Structure.** Hideji Suzuki. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 1, Feb. 1954, p. 30-49.

Data calculated from two theoretical models agree with experimental observations on steel and iron-nickel alloys. Tables, diagrams. 20 ref. (N8, N9, CN, Fe, Ni)

346-N. (Dutch.) **Experiments of J. Keverian on the Origin of Graphite Nodules.** P. E. A. van Nieuwland. *Metalen,* v. 9, no. 13, July 15, 1954, p. 203-207.

Theory based on assumption that graphite nodules originate from graphite needles growing into gas bubbles. Experimental data agree with theory. Micrograph, tables, graph. 5 ref. (N12, CI)

347-N. (French.) **Reflections and Remarks Concerning Phenomena Accompanying the Tempering of Steels.** A. Sourdillon. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 414-430.

Effects of heating rate, time of holding in gamma range and grain size on austenite formation and its subsequent decomposition after cooling. Graphs, table, diagrams, photographs. 71 ref. (N8, J29, ST)

348-N. (French.) **TTT-Curves and Heat Treatments.** L. Habraken. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 473-489.

Defines and outlines present knowledge concerning TTT curves and their usefulness in heat treatments. Charts, micrographs. 27 ref. (N8, J general, ST)

349-N. (German.) **Tests for Clarifying the Transformation Behavior of Chromium Steel Forming Special Carbides.** Franz Wever and Walter Koch. *Stahl und Eisen,* v. 74, no. 16, July 29, 1954, p. 989-1000.

Changes in composition and shapes of carbides and ferrite grains during isothermal transformations. Micrographs, graphs. 10 ref. (N8, AY)

350-N. (Swedish.) **Eutectic Solidification in Grey, White and Mottled Cast Iron of Hypo-Eutectic Composition.** A. Hultgren, Y. Lindblom and E. Rudberg. *Gjuteriet,* v. 44, no. 7, July 1954, p. 109-124.

Samples quenched at predetermined points on cooling curves. Appearance of the graphite-austenite aggregates, their composition and their general manner of development, related to cooling curves, indicate direct formation from the melt by eutectic reaction. Graphs, micrographs, diagram, tables. 6 ref. (N12, CI)

351-N. Graphitization of Certain Fe-C-Ti Alloys. A. B. Beach and R. W. Heine. *American Foundrymen's Society, Preprint no.* 54-1, 1954, 4 p.

Nature of stable system and alloying behavior of titanium in white cast irons in the malleable iron composition range. Phase diagram, micrographs, tables. 9 ref. (N8, CI)

352-N. Graphitization of Rims in Malleable Iron. H. A. Schwartz and J. D. Hedberg. *American Foundrymen's Society, Preprint no.* 54-12, 1954, 4 p.

Progress of graphite formation, while annealing malleable iron between A_1 stable and A_1 metastable, temperatures was examined near the surface of a fairly heavy casting. Tables, micrographs. (N8, CI)

353-N. Effect of Plastic Deformation of Hard Iron on Subsequent Annealing. W. K. Bock. *American Foundrymen's Society, Preprint no.* 54-68, 1954, 4 p.

Indicates that plastic deformation of white iron produces increased speed of graphitization. A relation between amount of cold work and effect on graphitization is indicated. Micrographs, graph. 2 ref. (N8, Q24, J23, CI)

354-N. Effect of Cold Work on the Gamma → Alpha Transformation in Some Fe-Ni-Cr Alloys. B. Cina. *Iron and Steel Institute, Journal,* v. 177, Aug. 1954, p. 406-422 + 3 plates.

Explains precise joint alloying effects of nickel and chromium. Tables, graphs. 58 ref. (N8, SS)

355-N. Basic Processes Involved in Tempering Plain Carbon and Low-Alloy Steels. W. S. Owen. *Iron and Steel Institute, Journal,* v. 177, Aug. 1954, p. 445-449; disc., p. 449-450.

Possible mechanisms controlling

the kinetics of reactions. Graphs, micrograph. 23 ref.
(N8, J29, CN, AY)

356-N. Precipitation of Impurities at Dislocations in Heat-Treated Silicon. Sumner Mayburg. *Physical Review*, v. 95, ser. 2, Aug. 1, 1954, p. 838-839.

Heat treatment above or below 900° C. increases or decreases respectively room temperature conductivity. 5 ref. (N7, P11, Si)

357-N. Structural (Phase) Transformations in Iron-Graphite Powder Products During Sintering. V. I. Likhtman and I. N. Smirnova. *Henry Brutcher, Altadena, Calif., Translation no.* 3015, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 86, no. 6, 1952, p. 1151-1153.)

Previously abstracted from original. See item 241-N, 1953. (N6, H15)

358-N. Laws Governing the Coalescence of Carbides in Plain Carbon Steel During Isothermal Tempering. S. Z. Bokshtein. *Henry Brutcher, Altadena, Calif., Translation no.* 3037, 13 p. (From *Zhurnal Tekhnicheskoi Fiziki,* v. 17, no. 12, 1947, p.1514-1520.)

Tests on 0.40 carbon steel at 1165° F. Kinetics of coalescence. Tables, graphs. 13 ref. (N8, J29, CN)

359-N. Kinetics of the First Stage of the Martensite Decomposition. G. Kurdyumov and L. Lysak. *Henry Brutcher, Altadena, Calif., Translation no.* 3041, 15 p. (From *Zhurnal Tekhnicheskoi Fiziki,* v. 19, no. 5, 1949, p. 525-531.)

Austenited decomposition as function of time at 80, 100 and 120° C. Discussion of Hägg's earlier interpretation. Graphs. 7 ref. (N8, CN)

360-N. Use of Ultrasonic Waves to Produce Orientation in Crystalline Substances. A. Kapustin. *Henry Brutcher, Altadena, Calif., Translation no.* 3066, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 71, no. 3, 1950, p. 451-452.)

Experiments using gelatin, potassium sodium tartrate and hyposulfite. (N5)

361-N. Crystallization of Gray Iron as an Example of an Anomalous Eutectic. (Part VI of Paper "Effect of Foreign Nuclei Upon Crystallization of Metals and Alloys, Particularly on Formation of Eutectic in Gray Iron".) W. Patterson. *Henry Brutcher, Altadena, Calif., Translation no.* 3076, *24 p. (Slightly Condensed from Giesserei, Technisch-Wissensch. Beihefte,* 1952, nos. 6-8, p. 367-374.)

Effect of melting and superheating on supercooling. Effects of various additions on graphite and primary austenite. Table, graphs, micrographs. 4 ref. (N12, CI)

362-N. Influence of Elements Forming Sparingly Soluble Carbides Upon the Decomposition of Austenite. L. I. Kogan and R. I. Entin. *Henry Brutcher, Altadena, Calif., Translation no.* 3318, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 94, no. 4, 1954, p. 693-696.)

Previously abstracted from original. See item 212-N, 1954. (N8, AY)

363-N. (English.) **Preferred Orientation in Alpha-Uranium.** C. M. Mitchell and J. F. Rowland. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 559-572.

Textures for various rolling temperatures. Derivation of unit cell probability. Mechanism of deformation during tension, compression and rolling. Graphs, diagrams, table. 9 ref. (N5, Q24, U)

364-N. (English.) **X-Ray Measurement of Order in CuAu.** B. W. Roberts. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 597-603.

Geiger counter spectrometer measurements on filings quenched from various annealing temperatures. Tables, graphs. 11 ref. (N10, Cu, Au)

365-N. (English.) **Thermodynamics of Ordering Alloys. II. The Gold-Copper System.** R. A. Oriani. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 608-615.

Tests using galvanic cell method show negative deviations from Raoult's law in agreement with previous work. Degrees of short-range order agree with X-ray data. Diagram, tables, graphs. 31 ref.
(N10, Au, Cu)

366-N. (English.) **Transformation in Indium-Thallium Alloys.** A. H. Geisler. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 639-642.

Shear mechanism of phase transformations. Diagrams, table. 6 ref. (N6, In, Tl)

367-N. (English.) **The Order-Disorder Transformation in Cu-Au Alloys Near the Composition Cu_3Au.** J. B. Newkirk. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 644-645.

Analysis of previously published data. Graphs. 6 ref. (N10, Cu, Au)

368-N. (French.) **Conditions of Appearance of the Widmanstätten Structure in the Particular Case of a Hypo-Eutectoid Steel.** Albert Portevin, André Constant, and Georges Delbart. *Comptes rendus,* v. 239, no. 3, July 19, 1954, p. 209-212.

TTT-curves indicate that tempering constituents (pearlite, bainite,

martensite) from decomposition of austenite furnish formation domains of Widmanstätten structure resulting from intergranular segregation of pro-eutectoid ferrite in austenite. Graphs, micrographs. 3 ref. (N8, CN)

369-N. (French.) **Polygonization of Aluminum of Different Purities.** Christian de Beaulieu, Jean Talbot and Georges Chaudron. *Comptes rendus,* v. 239, no. 3, July 19, 1954, p. 270-272.

Effects of low-temperature rolling, reheating and quenching. Micrographs. 3 ref. (N5, Al)

370-N. (French.) **Structural Changes Taking Place During the Aging of a Cu, 2% Be Alloy.** A. Saulnier. *Revue de métallurgie,* v. 51, no. 7, July 1954, p. 467-481; disc., p. 481.

Changes in the alpha solid solution are essentially due to precipitation, spontaneous work hardening and recovery. Beta constituents which are out of solution after quenching at 800° C. undergo eutectoid transformation during aging. Diagrams, micrographs, graphs. 12 ref. (N7, Cu)

371-N. (German.) **Binary Layers. I. Diffusion of Silver Into Tellurium.** G. C. Mönch. **II. Effect of Film Thickness, Temperature, and Base on the Diffusion of Silver Into Tellurium. III. Change of Volume in the Diffusion of Silver Into Tellurium.** Th. Mohr. **IV. Electron Refraction Investigations of Thin Silver-Tellurium Layers.** U. Zorll. *Annale der Physik,* v. 14, nos. 6-8, 1954, p. 363-389.

Includes photographs, diagrams, graphs, tables, micrographs, electron-refraction pictures. 27 ref. (N1, Ag, Te)

372-N. (German.) **The Behavior of Rhenium Towards Silver and Copper.** U. Holland-Nell and F. Sauerwald. *Zeitschrift für anorganische und allgemeine Chemie,* v. 276, nos. 3-4, June 1954, p. 155-158.

Shows that rhenium is practically insoluble in molten or solid copper and silver. 2 ref. (N12, Re, Cu, Ag)

373-N. (German.) **Magnetially Oriented Structures in Permanent Magnets.** Klaus J. Kronenberg. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 440-447.

Electron-microscopic studies of oxide-film imprints on Alnico reveal highly dispersed oriented microstructures. Diagrams, graph, micrographs. 34 ref. (N5, P17, SG-n)

374-N. Manganese Modification of the Fe-S-O System. D. C. Hilty and Walter Crafts. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 959-967.

Pseudoternary solidification diagram for system containing 1% manganese in the solid phase. Experimental data. Graphs, tables, micrographs. 18 ref. (N12, ST)

375-N. Diffusion of Boron in Alpha Iron. Paul E. Busby and Cyril Wells. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 972.

Calculation based on penetration curves. Agrees with published data. Graph, table. (N1, Fe, B)

376-N. Precipitation of Iron Oxide From Alpha Fe-O Solid Solutions. A. U. Seybolt. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 979-982.

Metallographic study. Mechanism of oxygen diffusion. Partial Fe-O phase diagram. Graph, table, micrographs. 4 ref. (N7, N1, Fe)

377-N. Rate of Self-Diffusion in Polycrystalline Magnesium. P. G. Shewmon and F. N. Rhines. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1021-1025.

Use of radioactive magnesium isotope to study diffusion rate. Techniques and experimental data. Diagrams, tables, graphs. 13 ref. (N1, Mg)

378-N. Self-Diffusivity Along Edge-Dislocation Singular Lines in Silver. A. A. Hendrickson and E. S. Machlin. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1035-1037.

Surface - accumulation diffusion technique and experimental data. Radiographs, micrographs, table. 7 ref. (N1, Ag)

379-N. On the Nucleation of Pearlite. M. E. Nicholson. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1071-1074.

Two-mode model shows that an alloying element can have different effects on hardenability depending on whether ferrite or cementite initiates pearlite nucleation. Graphs. 16 ref. (N2, ST)

380-N. Ordering Reaction of the Cu_4Pd Alloy. A. H. Geisler and J.

B. Newkirk. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1076-1082.

X-ray analysis indicates a tetragonal unit cell for the ordered phase. Increase of hardness is interpreted in terms of coherency strains. Graphs, diffraction patterns, tables, micrographs, diagrams. 8 ref. (N10, Cu, Pd)

381-N. Mechanism for the Origin of Recrystallization Nuclei. John P. Nielsen. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1084-1088.

Proposes "geometrical coalescence" as logical origin for secondary recrystallization. Diagrams, micrograph, graph. 8 ref. (N5)

382-N. (German.) **Application of Time-Temperature - Transformation Diagrams to Special Problems of Producing Highly-Stressed Welded Structural Parts.** Franz Nehl and Adolf Rose. *Stahl und Eisen,* v. 74, no. 17, Aug. 12, 1954, p. 1054-1061; disc., p. 1061-1062.

TTT-diagram aids development of stress-resistant alloyed steels which are not susceptible to weld cracking; cooling processes during welding determined from temperature, microstructures and hardness. Graphs, micrographs. 5 ref. (N8, K general, Q25, AY)

383-N. (Russian.) **Effect of Small Additions of Iron on Decomposition of Supersaturated Solid Solutions of Silver in Copper.** V. I. Arkharov and I. P. Polikarpova. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1244-1246.

Internal adsorption as cause of accelerating effect. Micrographs. 7 ref. (N7, Ag, Fe, Cu)

384-N. (Russian.) **Solubility of Silver in Copper in Presence of Small Additions of Beryllium or Iron.** V. I. Arkharov, S. D. Vangengeim, L. S. Magat and I. P. Polikarpova. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1247-1253.

X-ray analysis, chemical compositions of alloys. Parameters. Tables, graphs. 5 ref. (N12, Ag, Fe, Be, Cu)

385-N. How to Understand Annealing and Hot Working of Metals. Samuel Storchheim. *American Machinist,* v. 98, Sept. 13, 1954, p. 161-168.

Recrystallization, grain and secondary grain growth, factors affecting recrystallization, warpage, atom alignment, effect of temperature and failure at high temperature. Micrographs, graphs, tables. (N5, N3, J23)

386-N. Accelerated Strain Aging of Mild Steel. B. B. Hundy. *Iron and Steel Institute, Journal,* v. 178, Sept. 1954, p. 34-38.

Relation of room temperature aging time and time at elevated temperatures. Experimental conformation up to 200° C. Graphs, tables. 15 ref. (N7, CN)

387-N. The State of the Carbon in Austenite and Martensite as Revealed by the Eggertz Test. F. C. Thompson and A. R. Chaudhuri. *Iron and Steel Institute, Journal,* v. 178, Sept. 1954, p. 44-50.

Experimental study on distribution of carbon between the carbide and elemental forms for various quenching and tempering temperatures. Table, graphs. 13 ref. (N8, CN)

388-N. The Structure of Liquid Metals. B. R. T. Frost. Paper from "Progress in Metal Physics", v. V, Interscience Publishers, Inc., p. 96-142 + 1 plate.

Theories of the liquid state, stability of liquids, immiscibility, freezing and nucleation. Tables, photograph, graphs, diagrams. 119 ref. (N14)

389-N. Report on Precipitation. H. K. Hardy and T. J. Heal. Paper from "Progress in Metal Physics", v. V, Interscience Publishers, Inc., p. 143-278 + 18 plates.

Thermodynamics and nucleation theories. Solid solutions. Reaction kinetics. Age hardening alloys. Graphs, micrographs, spectra, phase diagrams, tables. 350 ref. (N12, P12)

390-N. Solidification of Metals. Ursula M. Martius. Paper from "Progress in Metal Physics", v. V, Interscience Publishers, Inc., p. 279-309 + 3 plates.

Principles and theories of solidification of ingots and castings. Substructures. Effects of impurities. Diagrams, graphs, micrographs, photographs, tables. 55 ref. (N12)

391-N. (French.) **Contribution to the Radio-Crystallographic Study of Allotropic Transformations Induced by Pressure.** Louis Guengant and Boris Vodar. *Comptes rendus,* v. 239, no. 5, Aug. 2, 1954, p. 431-433.

Effects of compression on powder and solid specimens. 6 ref. (N6, Be)

392-N. (German.) **Structural Changes During Age Hardening.** V. Gerold. *Aluminium,* v. 30, nos. 8-9, Aug.-Sept. 1954, p. 331-333.

Kinetic study, X-ray investigation of aluminum-silver and aluminum-copper alloys giving an insight into atomic processes during natural and artificial aging. Graphs, diagram. 6 ref. (N7, Al)

393-N. (German.) **Solubility of Silver Oxide in Molten Copper Oxide and Lead Oxide.** Ernst Justus Kohlmeyer and Helmut Hennig. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 8, Aug. 1954, p. 330-335.

Experimental investigation of the Cu_2O-PbO-Ag_2O system and its relation to refining copper-bearing silver. Diagrams, table, micrographs. 6 ref. (N12, C21, Ag, Cu)

394-N. (German.) **The Isotope Effect in the Electrolytic Migration of Copper Ions in Molten Cuprous Chloride.** A. Lundén and E. Berne. *Zeischrift für Naturforschung,* v. 9a, nos. 7-8, July-Aug. 1954, p. 684-689.

Experiments on the electrolytic concentration of Cu^{65} at the boundary between molten CuCl and $PbCl_2$, determination of the relative migration rates of the Cu isotopes, and computation of the mass effect. Tables, diagram. 14 ref. (N12, S19, Pb, Cu)

395-N. (German.) **A New Phase Transformation in the Zn-Sb System.** Hermann Bruns and Günter Lautz. *Zeitschrift für Naturforschung,* v. 9a, nos. 7-8, July-Aug. 1954, p. 694-695.

Resistance temperature anomaly of a Zn-Sb alloy with 57.7% Sb at −10 to −20° C. explained as a phase transformation of the beta Zn_4Sb_3 crystal. Graphs, table. 8 ref. (N6, Zn, Sb)

396-N. (German.) **Tellurium Monocrystal According to the Czochralski Process.** J. Weidel. *Zeitschrift für Naturforschung,* v. 9a, nos. 7-8, July-Aug. 1954, p. 697.

Method of growing tellurium crystals. Photograph. 6 ref. (N12, Te)

397-N. Conditions for Dendritic Growth in Alloys. W. Morris, W. A. Tiller, J. W. Rutter and W. C. Winegard. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 17, 1954, 9 p.

Shows that for a given composition there exists a critical ratio of solidification rate and temperature gradient for growth to start. Graphs, micrographs, table. 8 ref. (N12, Sn, Pb)

398-N. Thermodynamics of Binary Interstitial Solid Solutions. Rudolph Speiser and J. W. Spretnak. *American Sociey for Metals, Transactions,* v. 47, *Preprint No.* 19, 1954, 16 p.

Theoretical treatment of strain energy and compound formation. Explains directions of the solvus lines. Graphs, table. 8 ref. (N12, P12)

399-N. Further Study of Microstructural Changes on Tempering Iron-Carbon Alloys. B. S. Lement, B. L. Averbach and Morris Cohen. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 21, 1954, 26 p.

Changes occurring between 700° F. and Ac_1 studied by light and electron microscopy. Expression for minimum stable size of cementite particles at grain boundaries. Tables, graphs, micrographs. 20 ref. (N8, CN)

400-N. The Isothermal Transformation of Austenite Under Externally Applied Tensile Stress. S. Bhattacharyya and George L. Kehl. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 22, 1954, 33 p.

Applied stress has marked effect on beginning and completion of austenite-bainite transformation in carbon and alloy steels. Tables, diagram, graphs, micrographs. 36 ref. (N8, CN, AY)

401-N. The Effect of Cold Work and Recrystallization on the Formation of the Sigma Phase in Highly Stable Austenitic Stainless Steels. A. J. Lena and W. E. Curry. *American Society for Metals,* v. 47, *Preprint No.* 27, 19 p.

Cold work below a definite critical amount has little effect or may retard sigma formation. Tables, graphs, micrographs. 5 ref. (N5, N6, SS)

402-N. The Laves and Chi Phases in a Modified 12 Cr Stainless Alloy. F. L. VerSnyder and H. J. Beattie, Jr. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 28, 1954, 18 p.

Tests on series of heats with various titanium additions show formation of Chi-phase increases with titanium content. Tables, micrographs, diagram. 17 ref. (N6, SS)

403-N. Secondary Graphitization of Quenched and Tempered Ductile Cast Iron. J. C. Danko and J. F. Libsch. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 32, 1954, 12 p.

Metallographic studies show increased silicon results in more secondary graphite. Table, micrographs. 13 ref. (N8, CI)

404-N. A Method for Determining the Continuous Cooling Transformations in Steel. R. D. Chapman and W. E. Jominy. *American Society*

for Metals, Transactions, v. 47, *Preprint No.* 33, 1954, 16 p.

Equipment and techniques for magnetic testing. Test data for four alloy steels. Diagrams, graphs, tables. 9 ref. (N8, M23, AY)

405-N. Transformation in a Titanium-Chromium Alloy. H. M. Otte. *Nature,* v. 174, Sept. 11, 1954, p. 506.

Effect of deformation on structure of alloy containing 90% titanium and 10% chromium. 3 ref. (N6, Q24, Ti)

406-N. The Diffusion of Carbon in Alpha Iron. W. R. Thomas and G. M. Leak. *Philosophical Magazine,* v. 45, 7th ser., no. 368, Sept. 1954, p. 986-987.

Determination of diffusion coefficients at 0-100° C. Graph, table. 3 ref. (N1, Fe)

407-N. (English.) **On the Thermostatic Treatment of High Speed Steel and the Behavior of the Residual Austenite.** Sadao Koshiba, Kazuo Tanaka and Asao Inada. *Hitachi Review,* 1954, no. 6, July, p. 135-142.

Behavior of residual austenite in low-tungsten high speed steel, in regard to the effects of different hot bath temperatures and holding times on Ar″ transformation, magnetic saturation strength, the heat expansion curve during isothermal treatment and changes following low-temperature treatment. Graphs, table. 2 ref. (N8, TS)

408-N. (Russian.) **Problem of Temperature of Start of Transformation of Pearlite Into Austenite During Rapid Heating.** D. M. Gurevich. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1268-1272.

Experimental techniques. Effects of spot welding thermocouples to the specimen. Graph, diagram, oscillograms. 17 ref. (N8, ST)

409-N. Graphite Formation in Cast Iron Inoculated With Magnesium. K. P. Bunin and Y. N. Taran. *Henry Brutcher, Altadena, Calif., Translation no.* 3352, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 94, no. 6, 1954, p. 1061-1063.)

Previously abstracted from original. See item 214-N, 1954. (N8, CI, Mg)

410-N. Mechanism of Action of Silicon Upon Graphitization of Iron Alloys. K. P. Bunin. *Henry Brutcher, Altadena, Calif., Translation no.* 3353, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 95, no. 1, 1954, p. 97-100.)

Previously abstracted from original. See item 199-N, 1954. (N8, Fe, Si)

411-N. On the Cooling Curve of Spheroidal Graphite Cast Iron. A. Wittmoser. *Henry Brutcher, Altadena, Calif., Translation no.* 3358, 9 p. (Condensed from *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, 1953, p. 431-434.)

Previously abstracted from original. See item 23-N, 1954. (N8, J general, CI)

412-N. (French.) **On Secondary Hardening in a Chromium-Molybdenum Steel.** L. Habraken. *Revue de métallurgie,* v. 51, no. 8, Aug. 1954, p. 541-550; disc., p. 550.

Studies of 2.25% chromium, 1% molybdenum steel. Secondary hardening occurs due to transformation of austenite into ferrite and carbide, and to a structural hardening connected with the formation of a special carbide (phase X). Micrographs, graph, diagrams, table. (N8, Q29, AY)

413-N. (German and French.) **Diffusion Processes in Welding Technique.** Carl G. Keel. *Zeitschrift für Schweisstechnik,* v. 44, no. 9, Sept. 1954, p. 187-192.

Structure of metals, principle of diffusion, diffusion constants, theory of alloy formation, self-diffusion and contact reactions between solid metals. Diagrams, graphs, table. (To be continued.) (N1, K general)

414-N. (German.) **Morphology of the Chemical and Physical Disintegration of Zinc and Cadmium Monocrystals.** Sigmar German. *Zeitschrift für Metallkunde,* v. 45, no. 8, Aug. 1954, p. 484-489.

Procedure of growing crystals and disintegrating them by etching in solutions and hydrogen chloride vapor and by varporizing in high vacuum. Diagram, photographs, tables, micrographs. 13 ref. (N12, Zn, Cd)

415-N. (German.) **Texture Investigations on Wires. I. Deformation and Recrystallization Textures of Brass, Copper, and Silver. II. Effect of Alpha-Beta Transformation of Brass on Texture.** Johanna Grewen and Günter Wassermann. *Zeitschrift für Metallkunde,* v. 45, no. 8, Aug. 1954, p. 498-508.

Deformation and heat treatment of extruded and rolled wires, formation of deformation textures, explanation of recrystallization textures and relationship of orientation of alpha and beta phases in brass. Tables, X-ray photographs, micrographs, graph. 24 ref. (N5, Q24, Cu, Ag)

416-N. (Russian.) **Phenomena of Diffusion in Metals and Alloys.** B. I.

Pines. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 8, Aug. 1954, p. 1521-1540.

Mathematical treatment of kinetics of external and internal diffusion, recrystallization. 10 ref. (N1, N5)

417-N. Subcritical Decomposition of Carbide Phase in Some Low-Carbon Silicon Steels. E. D. Harry. *Iron and Steel Institute, Journal,* v. 178, Oct. 1954, p. 109-112.

Graphitization tests on three carbon steels with 1.8, 2.3 and 3.4% silicon. Effects of cold rolling, annealing atmosphere, specimen size and nature of surface. Tables. 11 ref. (N8, CN)

418-N. Phase Transformations in Titanium-Rich Alloys of Iron and Titanium. D. H. Polonis and J. Gordon Parr. *Journal of Metals,* v. 6, Oct. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Oct. 1954, p. 1148-1154.

High-purity alloys of titanium and iron, made by a technique of levitation melting, investigated with particular reference to martensite formation and decomposition in the hypo-eutectoid range. Photographs, graphs, micrographs. 15 ref. (N6, N9, Ti, Fe)

419-N. Delta Ferrite-Austenite Reactions and the Formation of Carbide, Sigma, and Chi Phases in 18 Chromium-8 Nickel-3.5 Molybdenum Steels. H. C. Vacher and C. J. Bechtoldt. *Journal of Research, National Bureau of Standards,* v. 53, Aug. 1954, p. 67-76.

Metallographic study of effect of chemical composition of the delta and gamma phases, and of the amount of delta, on the formation of carbide, sigma and chi phases. Tables, micrographs, X-ray diffraction patterns, graph. 7 ref. (N6, Cr, Mo. Ni)

420-N. The Austenite-Martensite Transformation. T. Ko. *Metallurgia,* v. 50, no. 299, Sept. 1954, p. 122-124.

Survey of work at Birmingham University from 1947-1953. 12 ref. (N8, ST)

421-N. Structural Transformations During the Aging of Aluminum-Copper-Magnesium Alloys. Yu. A. Bagaryatskii. *Henry Brutcher, Altadena, Calif., Translation no.* 2701, 9 p. (From *Zhurnal Tekhnicheskoi Fiziki,* v. 20, no. 4, 1950, p. 424-427.)

Results of X-ray analysis of single crystals of alloys after quenching and natural and artificial aging. Diagrams. 7 ref. (N7, Al, Cu, Mg)

422-N. Diffusion of Cobalt, Chromium, and Tungsten in Iron and Steel. P. L. Gruzin. *Henry Brutcher, Altadena, Calif., Translation no.* 3331, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 94, no. 4, 1954, p. 681-684.)

Previously abstracted from original. See item 211-N, 1954. (N1, Co, Cr, W, Fe, ST)

423-N. Crystallographic Relationships in the Transformation of Iron. H. Neerfeld. *Henry Brutcher, Altadena, Calif., Translation no.* 3341, 12 p. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 11-12, 1952, p. 471-473.)

Previously abstracted from original. See item 47-N, 1953. (N8, Fe)

424-N. (English.) **Inclusions in Iron Crystals Obtained by Recrystallization.** T. Smith. *Acta Metallurgica,* v. 2, no. 5, Sept. 1954, p. 647-654.

Small iron crystals included in large grains were usually exact twins of the large grain. Graphs, table, Laue photographs, diagrams. 17 ref. (N5, Fe)

425-N. (English.) **On Self-Diffusion in Cubic Metals.** F. S. Buffington and Morris Cohen. *Acta Metallurgica,* v. 2, no. 5, Sept. 1954, p. 660-666.

Theoretical derivation of constants relating selfdiffusion to temperature. Tables. 30 ref. (N1)

426-N. (German.) **Contribution to the Problem of Diffusion in Columnar Grains in Steel.** Hermann Schumann. *Metallurgie und Giessereitechnik,* v. 4, no. 8, Aug. 1954, p. 366-367, 359.

Columnar structure shown to have harmful effect on adherence of nitride layers due to tensile stresses caused by greater specific volume of Fe_4N segregated in grain boundaries parallel to the surface. Photograph, micrographs. 4 ref. (N1, Q25, AY)

427-N. (German.) **Reaction of Silver-Palladium Alloys With Sulfur at Elevated Temperature.** Ernst Raub, Bernhard Wullhorst, and Werner Plate. *Zeitschrift für Metallkunde,* v. 45, no. 9, Sept. 1954, p. 533-537.

Formation of brittle Ag_2Pd_3S and Ag_2S crystals. Photographs, micrographs, constitution diagram, table, interference diagrams. 10 ref. (N11, Ag, Pd)

428-N. (German.) **Change in Dimensions of Diffusion Specimens.** Wolfgang Seith and Rudolf Ludwig. *Zeitschrift für Metallkunde,* v. 45, no. 9, Sept. 1954, p. 550-554.

Effect of mutual diffusion of weld-joined metals on their dimensions in longitudinal and transverse direction over extended span of time. Graphs, diagram, micrographs. 8 ref. (N1, K general)

429-N. (Hungarian.) **Diffusion and Its Role in Casting.** Janos Prohaszka. *Ontöde,* v. 5, no. 8, Aug. 1954, p. 174-180,

Mechanism of diffusion, carbon and gas diffusion in iron castings, diffusion and tempering. Diagrams, graphs, photographs, table. 10 ref. (N1, E25, J29, CI)

430-N. (Russian.) **Formation of Graphite on the Surface of Steel During Heat Treatment Under Vacuum.** E. Z. Graifer and I. V. Salli. *Doklady Akademii Nauk SSSR,* v. 97, no. 4, Aug. 1, 1954, p. 663-665.

Importance of silicon as alloying element in graphitization of steels and wrought irons. Micrographs, graph. 5 ref. (N8, Fe, ST)

431-N. Effect of Certain Elements on the Graphitization of Steel. R. J. Fiorentino, A. M. Hall and J. H. Jackson. *ASME, Transactions,* v. 76, Oct. 1954, p. 1123-1129; disc., p. 1129-1130.

Graphitization process proceeds by means of a nucleation and growth mechanism, and a time rate of nucleation may possibly be involved. Tables, graphs. 16 ref. (N8, Al, N, Cr, Mn, Si, S, P, ST)

432-N. (English.) **The Dependence of the Thermal Vibration of the Cl-Ion in NaCl, KCl, and RbCl Crystals on the Crystallographic Directions.** U. Korhonen. *Ata Metallurgica,* v. 2, no. 5, Sept. 1954, p. 713-717.

Possibility of measuring the anharmonic part of thermal vibration by X-rays. Tables, graph. 5 ref. (N10)

433-N. (English.) **A Supplement to Investigation of Equilibrium Diagram of Fe-As-C System. (On Magnetic Transformation Point of Fe-As and Fe-As-C System.)** Hiroshi Sawamura and Toshisada Mori. *Memoirs of the Faculty of Engineering, Kyoto University,* v. 16, no. 3, July 1954, p. 182-189.

Includes graphs, table. 3 ref. (N11, M24, As, Fe)

434-N. (French.) **Recrystallization of Uranium After Passing Through the Transformation Points.** M. Pruna, P. Lehr and G. Chaudron. *Revue de métallurgie,* v. 51, no. 9, Sept. 1954, p. 589-596.

Dilatometric and metallographic studies. Table, graphs, micrographs, diffraction patterns. 3 ref. (N5, U)

435-N. (French.) **A Metallographic Study of the Beta-to-Alpha Transformation of Uranium in Stabilized Uranium-Chromium Alloys.** B. W. Mott and H. R. Haines. *Revue de métallurgie,* v. 51, no. 9, Sept. 1954, p. 614-616.

Mechanisms of transformation at room temperature after quenching from 720° C. Table, micrographs. 4 ref. (N6, U)

436-N. (German.) **Gas Release and Gas Permeability of Metals Used for Vacuum Tanks.** E. Waldschmidt. *Metall,* v. 8, nos. 19-20, Oct. 1954, p. 749-758.

Saturation pressure of different substances as a function of temperature, gas adsorption, getter effect, solubility and diffusion of gases in metals, and permeability of atomic and molecular gases. Graphs, tables. 57 ref. (N1, N15)

437-N. (Russian.) **The So-Called "Direct Decomposition" of Cementite.** K. P. Bunin. *Liteinoe Proizvodstvo,* 1954, no. 6, Sept., p. 23-26.

Microstructure shows forms in which graphitic inclusions appear, following various heat treatments. Micrographs, diagram. 17 ref. (N8, M27, ST)

438-N. Interpreting Graphitization for Power Engineers. Helmut Thielsch. *Combustion,* v. 26, Oct. 1954, p. 49-55.

Method for evaluating severity of graphitization and recommendations and techniques for rehabilitation. Micrographs, photographs, diagrams. (N8, Fe, Mo, Cr, AY)

439-N. The Ageing Characteristics of Some Ternary Aluminium-Copper-Magnesium Alloys With Copper: Magnesium Weight Ratios of 7:1 and 2.2:1. H. K. Hardy. *Institute of Metals, Journal,* v. 83, Sept. 1954, p. 17-34.

Hardness versus aging-time curves were obtained at 30, 110, 130, 165, 190, 220, 240 and 260° C. Form of curves explains effects of increasing magnesium on hardness. Graphs, tables. 96 ref. (N7, Q29, Al)

440-N. Reversibility of Martensite Transformations During the Heating of Iron-Carbon Alloys. V. N. Gridnev and V. I. Trefilov. *Henry Brutcher, Altadena, Calif., Translation no.* 3385, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 96, no. 4, 1954, p. 741-743.)

Previously abstracted from original. See item 325-N, 1954. (N8, ST)

441-N. (English.) **Electron Diffraction Study on the Ordered Alloy CuAu.** Shiro Ogawa and Denjiro Watanabe. *Physical Society of Japan, Journal,* v. 9, no. 4, July-Aug. 1954, p. 475-488.

Shows that two phases coexist in the ordered state for alloys in the 1:1 region of composition. Diffraction patterns, diagrams, table, graph. 24 ref. (N10, Cu, Au)

442-N. (English.) **Order-Disorder Transitions in A₂BC Ternary Alloys With the Plane Square or the Body-Centered Cubic Lattice.** Sukeaki Hosoya. *Physical Society of Japan, Journal,* v. 9, no. 4, July-Aug. 1954, p. 489-495.

Calculations show four types of ordered states can appear. Factors which determine type appearing. Graphs, diagrams, tables. 8 ref. (N10)

443-N. (English.) **Study on the Crystallization Process of Polished Layers of Metals by Electron Diffraction and Microscopy.** Kozo Nonaka and Kazutake Kohra. *Physical Society of Japan, Journal,* v. 9, no. 4, July-Aug. 1954, p. 512-520.

Crystal growth of Beilby layers of copper, nickel and gold at various temperatures. Diagrams, diffraction patterns, tables, graphs, micrographs. 20 ref. (N12, Cu, Ni, Au)

444-N. (French.) **On the "Nuclei" of Spheroidal Graphite.** Adalbert Wittmoser. *Fonderie,* 1954, no. 104, Sept., p. 4128-4145; disc., p. 4146.

Literature review and experimental observations on existence of "nuclei". Micrographs, tables, diagrams, charts. 64 ref. (N2, CI)

445-N. (French.) **Experimental Results on the Behavior of Nickel Cathodes Heated in a Vacuum.** J. Richard. *Vide,* v. 9, no. 51, May, 1954, p. 28-32.

Analysis of gases and volatile material evolved from nickel when heated in a vacuum. Tables, graphs. (N15, Ni)

446-N. Crystallization of Liquid Phase. I. N. Bogachev. Henry Brutcher, Altadena, Cal., Translation no. 3081, 21 p. (Part translation from book by I. N. Bogachev and A. A. Popov, entitled *"Phase Transformations in Iron-Carbon Alloys"*, Mashgiz, 1950, p. 4-17.)

Book abstracted from the original as item 114-N, 1953. (N12, Fe)

SECTION P

PHYSICAL PROPERTIES and TEST METHODS

1-P. Electrical Interaction of a Dislocation and Solute Atom. A. H. Cottrell, S. C. Hunter and F. R. N. Nabarro. *Philosophical Magazine,* v. 44, 7th ser., no. 357, Oct. 1953, p. 1064-1067.

Motts' estimate of the effective charge used to calculate the electrical interaction of a solute atom in copper alloys. 11 ref. (P15, Cu)

2-P. Surface Recombination in Germanium. W. N. Reynolds. *Physical Society, Proceedings,* v. 66, no. 406B, Oct. 1953, p. 899-901.

Studied by carrier injection into a long germanium block swept by an electric field and operated in a variable magnetic field at a right angle. Graphs. 4 ref. (P16, Ge)

3-P. The Superconducting and Normal Heat Capacities of Niobium. A. Brown, M. W. Zemansky and H. A. Boorse. *Physical Review,* v. 92, ser. 2, Oct. 1, 1953, p. 52-58.

Studied from 2.5 to 11° K. Transition temperature was found to be 8.70 ± 0.10° K. Diagrams, tables, graphs. 15 ref. (P11, P12, Nb)

4-P. The Vibrational Spectrum and Specific Heat of Sodium. E. Bauer. *Physical Review,* v. 92, ser. 2, Oct. 1, 1953, p. 58-67.

Spectrum derived by method suggested by Houston. The lattice part of the specific heat of metallic Na is calculated as a function of temperature. Tables, graphs. 17 ref. (P12, Na)

5-P. Some Magnetic Properties of Metals. VI. Surface Corrections to the Landau Diamagnetism and the de Haas-van Alphen Effect. R. B. Dingle. *Royal Society, Proceedings,* v. 219, ser. A, Oct. 7, 1953, p. 463-477.

Calculations and characteristic of large systems of electrons. 13 ref. (P16)

6-P. The Measurement of the Thermal Expansion of Single Crystals of Indium and Tin With a Photoelectric Recording Dilatometer. E. C. Vernon and S. Weintroub. *Physical Society, Proceedings,* v. 66, no. 405B, Oct. 1953, p. 887-894.

Dilatometer described. Thermal expansion of two tin and seven indium crystals measured. Crystals were made by slow solidification. Tables, graphs, diagrams. 21 ref. (P11, M23, Sn, In)

7-P. (German.) **Secondary Electron Emission of Semiconductors.** H. Gobrecht and F. Speer. *Zeitschrift für Physik,* v. 135, no. 5, 1953, p. 602-614.

Influence of impurity content of germanium, selenium, gallium, antimony, thallium and bismuth crystals on secondary electron emission. Diagrams, graphs, tables. 15 ref. (P15, Ge, Se, Ga, Sb, Tl, Bi)

8-P. The Energy State of Fatigued Copper. B. Welber and R. Webeler. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1558-1559.

Calorimetetric investigations. Table, graphs. 2 ref. (P12, Q7, Cu)

9-P. The Surface Free Energy of a Metal. I. Normal State. II. Superconducting State. R. Stratton. *Philosophical Magazine,* v. 44, 7th ser., no. 358, Nov. 1953, p. 1236-1258.

A mathematical analysis. Diagrams, tables. 14 ref. (P12, Cu)

10-P. (French.) **Supplementary Electrical Resistance and Thermo-Electric Force Due to Vacancies in Metals.** Florin Abeles. *Comptes rendus,* v. 237, no. 15, Oct. 12, 1953, p. 796-798.

Proposes a model based on the Born approximation. Results compared with experimental values for silver, gold and copper. 4 ref. (P15, Ag, Au, Cu)

11-P. (German.) **Thermodynamics of Several Reactions of Titanium Tetra-**

chloride. A. Münster and W. Ruppert. *Zeitschrift für Elektrochemie,* v. 57, no. 7, 1953, p. 558-564.

Critical discussion of published data. Thermodynamic computations of titanium tetrachloride reactions with different reagents. Tables, graphs. 26 ref. (P12, Ti)

12-P. (German.) **The Aging of Permanent Magnets.** Klaus J. Kronenberg. *Zeitschrift für angewandte Physik,* v. 5, no. 9, Sept. 1953, p. 321-329.

Ballistic precision measurements to study effects of a variety of conditions on pseudo-remanence of different alloyed permanent magnet steels. Graphs, 17 ref. (P16, AY)

13-P. (Russian.) **Effect of Boron on Electric Conductivity of Ingot Aluminum and of Refined Metal.** A. Domon and R. K. Vassel. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 1-2, 1953, p. 159-163.

Measurements of electrical conductivity of high-purity and of ordinary ingot aluminum alloyed with boron and with boron and titanium. Mechanism of refining with boron. Graphs. 3 ref. (P15, Al, Ti, B)

14-P. **The Heat Capacity and Entropy of Thorium From 18 to 300° K.** Maurice Griffel and Richard E. Skochdopole. *American Chemical Society, Journal,* v. 75, Nov. 5, 1953, p. 5250-5251.

Experimental data tabulated with enthalpy and Gibbs function as functions of temperature. Tables. 17 ref. (P12, Th)

15-P. **The Permeability of Silicon-Iron at Very Low Flux Densities.** Eberhard Both. *Communication and Electronics,* 1953, Nov., p. 656-661; disc., p. 661-664.

Measurements on specimens containing 3.25% silicon and annealed at various temperatures. Graphs, tables. 6 ref. (P16, Si, Fe)

16-P. **Effect of Chromium on the Thermodynamic Activity of Carbon in Liquid Iron.** F. D. Richardson and W. E. Dennis. *Iron and Steel Institute, Journal,* v. 175, Nov. 1953, p. 257-263.

Studies in the temperature range 1560-1660° C., at chromium concentrations of 10-80%. Results expressed in terms of the activity coefficient of carbon, which is markedly lowered by the chromium. Graphs, tables. 10 ref. (P12, Fe, Cr)

17-P. **The Equilibrium Controlling the Decurburization of Iron-Chromium-Carbon Melts.** W. E. Dennis and F. D. Richardson. *Iron and Steel Institute, Journal,* v. 175, Nov. 1953, p. 264-266.

Limiting carbon concentrations that can be reached for various chromium contents of the melt were calculated and shown to be in agreement with experimental determinations. Graphs. 6 ref. (P12, Fe, Cr)

18-P. (English.) **Longitudinal Magnetostriction in Nickel-Cobalt Alloys.** Mikio Yamamoto and Ryofu Miyasawa. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 1, 1953, p. 22-33.

Longitudinal magnetostriction in magnetic fields up to 900 oersteds measured by an optical-lever method. Dependency of the magnetostriction upon alloy composition, magnetic field and intensity of magnetization. Graphs. 13 ref. (P16, Co, Ni)

19-P. (English.) **On the Reduction Equilibrium Diagram of Iron Oxide.** Koji Sanbongi. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 1, Feb. 1953, p. 53-62.

The author corrected his previous reduction equilibrium diagram for the Fe-C-O system. Data for the Fe-H-O system calculated. Diagrams, tables. 10 ref. (P12, Fe)

20-P. (English.) **On the Magnetostrictive Constants of Face-Centered Cubic Nickel-Cobalt Alloys.** Mikio Yamamoto and Ryofu Miyasawa. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 2, Apr. 1953, p. 113-123.

An expression was derived for the saturation magnetostriction of polycrystalline specimens. Graphs. 16 ref. (P16, Co, Ni)

21-P. (English.) **On the Anomaly of the Specific Heat at High Temperatures in Alpha Phase Alloys of Iron and Chromium.** Hakaru Masumoto, Hideo Saito and Makoto Sugihara. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 3, June 1953, p. 204-207.

Measurements on quenched or annealed iron alloys, containing up to 55% chromium, at temperatures up to 900° C. Graphs. (P12, Fe, Cr)

22-P. (English.) **On Activities of Co-existing Elements in Molten Iron. I. The Activity of Carbon in Molten Iron.** Koji Sanbongi and Masayasu Ohtani. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 3, June 1953, p. 263-270.

Change in carbon content was determined by measuring electromotive force in a concentration cell. Activity values calculated and equilibrium relations in the iron-carbon-

oxygen system examined. Graphs, diagrams. 17 ref. (P12, Fe)

23-P. (Russian.) **Investigation of Thin Films of Intermetallic Compounds.** A. K. Kikoin and G. D. Fedorov. *Doklady Akademii Nauk SSSR,* v. 92, no. 6, Oct. 21, 1953, p. 1163-1165.

Components of a system were deposited on a plate by evaporation in a vacuum. Preparations investigated to determine optical properties for dielectrics. Graphs, micrograph. 4 ref. (P17, Mg, Sb)

24-P. (Russian.) **Calculation of the Energy of Distortion of the Lattice of the Third Type Depending on the Magnitude of Deformation.** N. S. Fastov. *Doklady Akademii Nauk SSSR,* v. 92, no. 6, Oct. 21, 1953, p. 1167-1170.

Energy of residual stresses found to be dependent on magnitude of uniform deformation in tension or compression. Graphs. 3 ref. (P12)

25-P. (Russian.) **Investigation of the Surface Tension of the Alloy Lead-Cadmium on the Boundary With Molten Eutectics LiCl-KCl and in Vacuum.** V. A. Kuznetsov, V. P. Kochergin, M. V. Tishchenko and E. G. Pozdnysheva. *Doklady Akademii Nauk SSSR,* v. 92, no. 6, Oct. 21, 1953, p. 1197-1199.

Electrocapillary phenomena of surface tension in a vacuum. All measurements made at temperatures above 450° C. Graphs. 11 ref. (P10, Pb, Cd)

26-P. (Russian.) **Solubility of Oxygen in Iron-Chromium and Iron-Chromium-Nickel Melts.** B. V. Linchevskii and A. M. Samarin. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 5, May, p. 691-704 + 4 plates.

Studies of the influence of chromium on oxygen solubility. Oxidation equations for chromium dissolved in liquid iron. Tables, graphs, micrographs. 3 ref. (P13, Fe, Ni, Cr)

27-P. **Rate of Displacement of Silver From Aqueous Silver Nitrate by Zinc and Copper.** Richard Glicksman, H. Mouquin and Cecil V. King. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 580-585.

Displacement rates measured by rotating cylinders of zinc and copper in silver nitrate solutions for short-time intervals, followed by analysis of the solutions for silver ion content. Graphs. 12 ref. (P13, Ag, Cu, Zn)

28-P. **Equilibrium Thermochemistry of Solid and Liquid Alloys of Germanium and of Silicon. I. The Solubility of Ge and Si in Elements of Groups III, IV and V.** Carl D. Thurmond. **II. The Retrograde Solid Solubilities of Sb in Ge, Cu in Ge, and Cu in Si.** Carl D. Thurmond and J. D. Struthers. *Journal of Physical Chemistry,* v. 57, Nov. 1953, p. 827-834; disc., p. 830, 834-835.

Activity and temperature coefficients; and solidus and liquidus curves. Graphs. 36 ref. (P12, N12, Ge, Si, Sb, Cu)

29-P. **Metallurgy. III. Researches on Pure Metals. Strain Aging and Permeability of Silicon Iron Sheet.** G. M. Leak, A. M. Sage and E. Ineson. *Metal Treatment and Drop Forging,* v. 20, Nov. 1953, p. 557-559, 562.

Studies on very pure iron and closely controlled alloys to find answers to commercial problems. Photographs, table, graph. (P16, N7, CN)

30-P. (English.) **Anomalous Properties of Dilute Alloys.** J. Korringa. *Physica,* v. 19, no. 9, Sept. 1953, p. 816-820; disc. p. 820.

Presents evidence to show that influence of small amounts of manganese, for example, on the electrical resistivity of noble metals is governed by interaction between the conduction electrons. Grap. (P15, Mn, EG-c)

31-P. (French.) **Comparative Effect of Traction and Compression on the Magnetic Properties of Alloy Steel.** Georges Vidal and Pierre Lanusse. *Comptes rendus,* v. 237, no. 16, Oct. 19, 1953, p. 902-904.

Investigation on 0.10% carbon steel. Effects of traction and compression plotted for various values of the inductor field. Graphs. 3 ref. (P16, AY)

32-P. (French.) **Thermo-Electric Force of Alloys.** J. Friedel. *Journal de physique et le radium,* v. 14, no. 11, Nov. 1953, p. 561-565.

Proposes application of Mott's calculation for determining electrical resistance changes caused by polyvalent substitution impurities in monovalent metals. Calculation applied to copper and gold-base alloys. Tables, graphs. 20 ref. (P15, Cu, Au, Mg, Si, Ti, Cr, Mn, Fe, Ni, Zr, Sn, W)

33-P. (French.) **The Determination of Optical Constants of Solid Metals Made by Means of Thick Plate.** D. Male and P. Rouard. *Journal de physique et le radium,* v. 14, no. 11, Nov. 1953, p. 584-587.

Investigations showing that the differences obtained with respect to optical constants from vapor-deposited layers and solid metals are due

to differences in structure rather than the quality of the methods. Tables. 12 ref. (P17, L25)

34-P. (French.) **The Forces of Polarizability in the Crystals. A. Herpin.** *Journal de physique et le radium,* v. 14, no. 11, Nov. 1953, p. 611-620.

Effect of ion polarizability on the evaluation of interionic forces in an ionic crystal. 17 ref. (P15, Cu, Ag, Al)

35-P. (German.) **Aging Tests on Bar-Shaped Permanent Magnets at Different Temperatures.** Klaus Kronenberg. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct., 1953, p. 441-446.

Investigation of the aging effect of temperature (500 to −190° C.) on the pseudoremanence of different magnetic metals and alloys. Graphs, diagram, table. 19 ref. (P16, N7, AY, Al, Co, Cr, Ni)

36-P. (German.) **Transition of Heat by Means of Free Convection in Metal Melts.** Hans Klein. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 450-456.

Reviews existing data. Compares them with practical results on zinc. Usual differential formula of heat conduction evaluated critically. Tables, graphs. 18 ref. (P12, P11, Zn)

37-P. (German.) **Anisotropy of the Absolute Thermo-Electric Voltage of Tin Between 0 and 280 C.** Frauke Cirkler. *Zeitschrift für Naturforschung,* v. 8a, no. 10, Oct. 1953, p. 646-659.

Calculations on eight extremely pure monocrystal rods. Production of specimens and experimental arrangement. Results compared with theoretical data of various authors. Tables, graphs. 21 ref. (P15, Sn)

38-P. (German.) **The Effect of Capacitatively Arranged Boundary Fields Upon the Conductivity of Thin Semiconductor Layers.** K. Zückler. *Zeitschrift für Physik,* v. 136, no. 1, 1953, p. 40-51.

Reports on measurements on thin Se and CuO_2 layers at room temperature and at −78 and +80° C. Results used as a basis for a new method for determining density of holes and mobility. Applicability of method. Graphs. 9 ref. (P11, Se)

39-P. (Russian.) **Electroconductivity of Metals at a Large Current Density.** E. S. Borovik. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 771-774.

Deviations from Ohm's law for platinum, tungsten and copper under various current densities. Tables, graphs. 4 ref. (P15, Cu, W, Pt)

40-P. (Russian.) **Effect of Temperature on Light Absorption in Thin and Ultra Thin Layers of Silver.** A. G. Gumeniuk. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 783-786.

As a result of heating silver layers at 230° C., surface migration of particles leads to their coalescence and formation of metallic particles. Tables, graphs. 9 ref. (P17, Ag)

41-P. (Russian.) **Characteristics of the Superconducting Modification of Bismuth.** N. V. Zavaritskii. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 787-790.

Relationship was noticed between thinness of a specimen and its superconductivity. Temperatures of 6 to 10 or 11° K. were used to induce superconductivity. Diagram, graphs. 8 ref. (P15, Bi)

42-P. (Russian.) **Theory of Magnetizability of Thin Metal Layers at Low Temperatures.** I. M. Lifshits and A. M. Kosevich. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 795-798.

Magnetic properties of a metal of finite thickness. 10 ref. (P16)

43-P. (Russian.) **Phase Transformation by Method of Internal Friction.** K. M. Rozin and B. N. Finkel'shtein. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 811-812.

Comparison of internal friction changes and electrical resistance of a tempered specimen at 800° C. showed that in 2.5 hr. electrical resistance decreased by 1.3% while internal friction increased by 180%. Graphs. 2 ref. (P15, Q22)

44-P. (Russian.) **Certain Physical Properties of Pb-Sb Alloys.** V. A. Iurkov. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 891-893.

Results of investigations of linear expansion, density, electrical resistance, and thermo-electromotive force of lead-antimony alloys. Increase of antimony decreased the thermo-electromotive force. Graphs. 5 ref. (P10, P15, Pb, Sb)

45-P. (Russian.) **Melting Points of Tin and Lead Under Pressures up to 34000 Kg. Per Cm².** V. P. Butuzov and M. G. Gonikberg. *Doklady Akademii Nauk SSSR,* v. 91, no. 5, Aug. 11, 1953, p. 1083-1084.

Melting point increased with pressure. Lead reached a maximum of 532° C. Graphs, table. 4 ref. (P12, Pb, Sn)

46-P. Metal-Ceramic Interactions: II. Metal-Oxide Interfacial Reactions at Elevated Temperatures. G. Economos and W. D. Kingery. *American*

Ceramic Society, Journal, v. 36, Dec. 1953, p. 403-409.

Interfacial reactions of various metals (Be, Mo, Nb, Ni, Si, Ti and Zr) with dense oxide specimens (Al_2O_3, BeO, MgO, ThO_2 and TiO_2) investigated at temperatures up to 1800° C. Photographs, tables, micrographs. 30 ref. (P10)

47-P. Neutron Capture γ-Rays From Heavy Odd-Charge Nuclei. G. A. Bartholomew and B. B. Kinsey. *Canadian Journal of Physics,* v. 31, Nov. 1953, p. 1025-1050.

Neutron capture gamma ray spectra of As, Nb, Rh, Ag, In, Sb, Pr, Ta, Au, and Tl are described. Tables, graphs. 27 ref.
(P10, As, Nb, Rh, Ag, In, Sb, Pr, Ta, Au, Tl)

48-P. Neutron Capture γ-Rays From Even-Charge Nuclei. B. B. Kinsey and G. A. Bartholomew. *Canadian Journal of Physics,* v. 31, Nov. 1953, p. 1051-1086.

Neutron capture gamma-ray spectra of Se, Sr, Zr, Mo, Cd, Sn, Ba, Sm, Gd, W, Pt, and Hg. Graphs, tables. 59 ref.
(P10, Se, Sr, Zr, Mo, Cd, Sn, Ba, Sm, Gd, W, Pt, Hg)

49-P. A Method for the Evaluation of Some Lattice Sums Occurring in Calculations of Physical Properties of Crystals. B. M. E. van der Hoff and G. C. Benson. *Canadian Journal of Physics,* v. 31, Nov. 1953, p. 1087-1094.

Includes tables. 20 ref.
(P general, M26)

50-P. The Decay of Cd^{105}. F. A. Johnson. *Canadian Journal of Physics,* v. 31, Nov. 1953, p. 1136-1147 + 1 plate.

Isotope $cadmium^{105}$ (55 min.) has been produced by $silver^{107}$ $(p, 3n)$ reaction in the McGill University synchrocyclotron and has been investigated by means of a 180° spectrograph of high resolution, a lens spectrometer and a scintillation spectrometer. Tables, graphs. 17 ref.
(P13, Cd, Ag)

51-P. A Note on the Ratio of the Quadrupole Moments of Li^6 and Li^7. N. G. Cranna. *Canadian Journal of Physics,* v. 31, Nov. 1953, p. 1185-1186.

Includes diagram. 3 ref. (P10, Li)

52-P. Some Characteristics of Secondary Emission from BeCu. F. J. Fitz Osborne. *Canadian Journal of Physics,* v. 31, Nov. 1953, p. 1189.

Includes diagrams. (P17, Be, Cu)

53-P. High Temperature Materials for Vacuum Service. Herbert B. Michaelson. *Materials & Methods,* v. 38, Dec. 1953, p. 110-115.

Special properties required of materials for service in vacuum include low vapor pressure, stability, low gas permeability and ease of outgassing. Photographs, tables, graphs, diagram. 10 ref.
(P10, P12, Q general, SG-h)

54-P. Progress Report on the NBS Permeameter. G. P. McKnight. *Metal Powder Association, Proceedings,* 1953, p. 6-12; disc., p. 12-13.

Principle of operation and several adaptations that have been made to make the instrument suitable for measuring iron core properties at high frequencies and to simplify the calculation of results. Photographs, diagrams, graphs. 5 ref. (P16, Fe)

55-P. A Method of Estimating Impurity Concentrations in Germanium. F. W. G. Rose and E. W. Timmins. *Physical Society, Proceedings,* v. 66, no. 407B, Nov. 1953, p. 984-986.

Resistivity of single samples of germanium has been measured in temperature range $T = 100\text{-}400°$ K. using both d.c. and a.c. (3kc/s) methods. Graphs. 5 ref. (P15, Ge)

56-P. The Thermal Conductivity of Magnesium at Low Temperatures. W. R. G. Kemp, A. K. Sreedhar and G. K. White. *Physical Society, Proceedings,* v. 66, no. 407A, Nov. 1953, p. 1077-1078.

Includes graphs. 10 ref. (P11, Mg)

57-P. (English.) **Some Facts About Superconductivity.** C. J. Gorter. *Physica,* v. 19, no. 9, Sept. 1953, p. 745-752; disc., p. 752-754.

Various problems of superconductivity. Graphs. 27 ref. (P15)

58-P. (English.) **Superconductivity and Lattice Vibrations.** H. Fröhlich. *Physica,* v. 19, no. 9, Sept. 1953, p. 755-761; disc., p. 761-764.

Theory of isotope effect suggests that in superconductors, coupling between electrons and lattice displacements is stronger than in normal metals. 9 ref. (P15)

59-P. (English.) **The Coherence Concept in Superconductivity.** A. B. Pippard. *Physica,* v. 19, no. 9, Sept. 1953, p. 765-772; disc., p. 772-774.

Coherence as a fundamental property of a superconductor. Suggests the way in which it may influence electrodynamical behavior leading to modifications of the London theory. 15 ref. (P15)

60-P. (English.) **Thermal Conductivity of Superconductors.** K. Mendelssohn. *Physica,* v. 19, no. 9, Sept. 1953, p. 775-785; disc., p. 785-787.

Reviews present available information with emphasis on recent experimental findings. Graphs. 24 ref.
(P11, Pb, Sn, Bi, In)

61-P. (English.) **The De Haas-Van Alphen Effect.** D. Shoenberg. *Physica,* v. 19, no. 9, Sept. 1953, p. 791-806.

Information obtained from comparison between experimental results and theory of magnetic susceptibility. New experiments at high fields. Table, oscillographs. 9 ref. (P16, Sn, Zn, Bi, Al, In, Ga, Cd, Tl, Be, Mg, Sb, Hg)

62-P. (English.) **Thermoelectricity at Low Temperatures.** G. Borelius. *Physica,* v. 19, no. 9, Sept. 1953, p. 807-814; disc., p. 814-815.

Several investigations on thermoelectric, resistometric and magnetic properties of various metals and alloys. Graphs. 20 ref. (P15, P16, Cu, Ag, Au, Cr, Mn, Fe, Co, Ni, Pd, Pt)

63-P. (English.) **Thermoelectric Power in Metals at Low Temperatures and Anomalous Impurity Scattering.** D. K. C. MacDonald. *Physica,* v. 19, no. 9, Sept. 1953, p. 841-845.

Marked deviations from theoretical predictions were found by experiments with thermo-electric power of alkali metals from 90° K. to liquid helium temperatures. Graphs. 6 ref. (P15, Sn, Ag, Cu, Bi, Ni)

64-P. (French.) **Variation of the Magnetic Permeability of Soft Steel Subjected to Periodic Stress.** Georges Vidal and Pierre Lanusse. *Comptes rendus,* v. 237, no. 20, Nov. 16, 1953, p. 1213-1215.

Tests with a specimen of annealed, 0.12% carbon steel, indicating existence of a reversible maximum of magnetic permeability under tension and absence of a similar characteristic under compression. Diagrams. (P16, CN)

65-P. (Russian.) **Surface Tension and the Heat of Evaporation of Metals.** S. M. Zadumkin. *Doklady Akademii Nauk SSSR,* v. 92, no. 1, Sept. 1, 1953, p. 115-118.

Establishes connection between surface tension and heat of sublimation. Tables. 9 ref. (P10, P12)

66-P. (Russian.) **Properties of a Thinly Rolled Permalloy.** L. I. Rabkin and P. I. Iuzvinskaia. *Elektrichestvo,* 1953, no. 10, Oct., p. 63-67.

Results of experimental investigations of properties of sheet permalloy for medium and high frequencies. Graphs, diagram. (P16, Ni)

67-P. (Russian.) **Activity of Carbon and Oxygen in Fe-C-O Melts.** A. M. Samarin and R. A. Karasev. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 8, Aug., p. 1130-1136.

Relationship between activity coefficients of carbon and oxygen and the dependence on carbon concentration. Tables, graphs. 3 ref. (P12, Fe)

68-P. (Russian.) **Investigation of Properties of Liquid Iron-Chromium Alloys by the Method of Electromotive Forces.** O. A. Esin and N. A. Vatolin. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 8, Aug., p. 1137-1142.

Properties of iron-carbon-chromium alloy of different compositions were investigated at 1460° C. Tables, graphs. 10 ref. (P general, Fe, Cr)

69-P. An Acoustic Study of the Delta *E*-Effect and the Damping of the Elastic Waves in Polycrystalline Nickel. V. P. Sizov. *National Science Foundation Translation,* no. 31, July 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 427.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Results of an experimental study of effect of magnetic field and elastic stresses in polycrystalline nickel. Graphs. 6 ref. (P16, Q21, Ni)

70-P. Magnetic Moments and the Crystal Structure of Ferromagnetic Metals and Alloys. F. Galperin. *National Science Foundation Translation,* no. 68, Sept. 1953, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 643-646.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Simple formula previously proposed for magnetic moments of ferromagnetic metals and other ferromagnets can be generalized to ferrites and to similar chemical compounds in satisfactory agreement with experiment. Tale, graph. 12 ref. (P16, M26, Mn, Fe, Co, Ni, Cu, Mg, Zn)

71-P. Measurements of Melting Points of Metals Under Extremely High Pressures. V. P. Butuzov, M. G. Gonikberg and S. P. Smirnov. *National Science Foundation Translation,* no. 76, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, no. 4, Apr. 1953, p. 651-653.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 511-P, 1953. (P12)

72-P. A Study of the Effect of Pressure on Magnetic Saturation of Iron at the Temperature of Liquid Nitrogen. F. Galperin, S. Larin and A. Shishkov. *National Science Foundation Translation,* no. 36, July 1953, 4 p. (Original in *Doklady Akademii*

Nauk SSSR, v. 89, 1953, p. 419.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Experiments conducted at −196° C. and 20° C. Gas which does not solidify at 77° K. and 2000 atmospheres was used as compressing medium. Table, diagrams. 7 ref. (P16, Fe)

73-P. Thermoelectric Power of Monovalent Metals at High Temperature. D. K. C. MacDonald and S. K. Roy. *Philosophical Magazine,* v. 44, 7th ser. no. 359, Dec. 1953, p. 1364-1370.

Band theory of metals applied to analyze thermo-electric power of "simple" metals at high temperatures. Graphs, tables. 5 ref. (P15)

74-P. Search for the Hall Effect in a Superconductor. I. Experiment. H. W. Lewis. *Physical Review,* v. 92, ser. 2, Dec. 1, 1953, p. 1149-1151.

A search for Hall effect in superconducting vanadium proved negative but an upper limit of 150 x 10^{-6} electromagnetic units was established. 3 ref. (P15, V)

75-P. (Russian.) **Ferromagnetic Resonance of Nickel-Zinc Ferrites.** E. I. Kondorskii and N. A. Smol'kov. *Doklady Akademii Nauk SSSR,* v. 93, no. 2, Nov. 11, 1953, p. 237-240.

Ferrites investigated were in form of solid solutions. Specimens were machined by abrasives and had the aspect of washers with a thickness of 1.00-1.03 mm. with an external diameter of 16 mm. and an internal diameter of 5 mm. Diagram, graphs, table. 10 ref. (P16, Ni, Zn)

76-P. (Russian.) **Resonance Absorption in Metals in Centimetric Waves.** S. G. Salikhov. *Doklady Akademii Nauk SSSR,* v. 93, no. 2, Nov. 11, 1953, p. 241-244.

Results of measurement of resonance absorption in 28 paramagnetic and composite-diamagnetic metals at temperatures of 290 and 90° K. on a frequency 9.378x10^9 cycles per sec. Data obtained on the form and intensity of lines of paramagnetic absorption differ appreciably from results of measurements on low frequencies. Table, graphs. 5 ref. (P16)

77-P. (Russian.) **Heat Conductivity of Ferromagnetic Metals at Low Temperatures.** A. I. Rezanov and V. I. Cherepanov. *Doklady Akademii Nauk SSSR,* v. 93, no. 4, Dec. 1, 1953, p. 641-644.

Calculations of thermal resistance at low temperatures. Comparisons made with thermal resistance of the ionic lattice. 3 ref. (P11)

78-P. (Book—German.) **(Industrial Heat Transfer.) Der industrielle Wärmeübergang.** A Schack. Ed. 4. 400 p. 1953. Verlag Stahleisen, Dusseldorf, Germany. 38.50 D.M.

Several theories on heat transfer by convection are compared, for laminar flow and for turbulent flow along plates, in tubes and through banks of tubes. Heat transfer by condensing vapors. Radiation from solid bodies, from clear furnace gases and from luminous flames is discussed. Detailed attention is given to the calculation of heat exchangers, such as recuperators and regenerators. The section on the mechanism of heat transfer in industrial furnaces is rather brief. The section on the relation between pressure drop and heat transfer is very good.—W. Trinks. (P11)

79-P. Metal-Ceramic Interactions: III. Surface Tension and Wettability of Metal-Ceramic Systems. Michael Humenik, Jr., and William D. Kingery. *American Ceramic Society, Journal,* v. 37, Jan. 1954, p. 18-23.

Method using precise sessile-drop method. Diagrams, photograph, graphs, tables. 6 ref. (P10)

80-P. The Melting Point of Titanium. T. H. Schofield and A. E. Bacon. *Institute of Metals, Journal,* v. 82, Dec. 1953, p. 167-169.

Melting point of titanium has been redetermined using a technique which reduces possibility of contamination by refractories. Tables. 10 ref. (P12, Ti)

81-P. The Density of Molten Iron. V. H. Stott and J. H. Rendall. *Iron and Steel Institute, Journal,* v. 175, Dec. 1953, p. 375-378.

Two closely agreeing measurements of density of molten iron (averaging 7.00 g. per cc. at 1564° C.) have been made by filling in *vacuo* a pyknometer made of alumina and determining mass of iron contained in it. Diagram. 14 ref. (P10)

82-P. A Graphite Tube Resistance Furnace and Voltage Regulator for Equilibrium Studies in the Temperature Range 1500-1800° C. W. E. Dennis, F. D. Richardson and J. H. Westcott. *Journal of Scientific Instruments,* v. 30, Dec. 1953, p. 453-455.

Design and performance characteristics. Diagrams, graph. 3 ref. (P12, M23)

83-P. The Study of Surface Reactions With the Aid of Large Metal Crystals. Allan T. Gwathmey. *Record of Chemical Progress,* v. 14, no. 3, 1953, p. 116-129.

Single crystal method of studying surface reactions, emphasizing importance of crystal face. Different

faces of crystal often behave as if they were different metals. Diagrams, photographs, table. 14 ref. (P10)

84-P. (English.) **Alloys With a Fixed Rate of Dilatation.** *Aciers Fins & Spéciaux Francais,* 1953, no. 13, Mar., p. 82-85.

Physical properties of iron-nickel, iron-chromium and iron-nickel-cobalt alloys. Tables, graph. (P11, Fe, Cr, Ni, Co)

85-P. (French.) **Some Compounds of Cobalt and Iron With Very Weak and Constant Paramagnetism.** A. Serres. *Journal de physique et le radium,* v. 14, no. 12, Dec. 1953, p. 689-690.

Magnetization coefficients of several lanthanum alloys with iron and cobalt measured. Tables. 7 ref. (P16, Co, Fe)

86-P. (German.) **An Amplitude and Temperature-Dependent Hysteresis of Alpha Iron at −70°C.** Günther Sorger. *Zeitschrift für angewandte Physik,* v. 5, no. 11, Nov. 1953, p. 406-413.

Experimental and theoretical studies made to explain hysteresis losses in an iron-silicon alloy with decreasing temperature. Table, graphs. 8 ref. (P16, Fe, Si)

87-P. (German.) **The Electrical Properties of Thin Vapor-Deposited Silver Films at 3000 Megacycles.** Friedrich J. Tischer. *Zeitschrift für angewandte Physik,* v. 5, no. 11, Nov. 1953, p. 413-415.

Theoretical investigation of wave expansion through silver films. Depth of penetration, reflexion and transmission factors. Graphs, table. (P15, Ag)

88-P. (Hungarian.) **Application of Thermodynamic Functions to Metallurgy.** Aurel Horvath. *Kohaszati Lapok,* v. 8, no. 12, Dec. 1953, p. 245-258.

First law of thermodynamics, molecular-kinetic and thermodynamic explanation of heat capacity, law of equipartition of energy and characteristics related to heat capacity of substances in different states of aggregation. Graphs, tables. (To be continued.) (P12)

89-P. (Russian.) **Influence of Plastic Deformation on the Form of the Curve of Iron and Nickel Magnetization in the Area of High Magnetic Fields.** V. V. Parfenov. *Doklady Akademii Nauk SSSR,* v. 93, no. 3, Nov. 21, 1953, p. 435-438.

Influence of torsion and elongation on magnetization in a magnetic field of up to 10000 oersteds. Graphs. 11 ref. (P16, Q24, Fe, Ni)

90-P. (Russian.) **Change of Magnetic Properties of Magnets Which Are Under Large Compression Stresses.** M. A. Grabovskii and E. I. Parkhomenko. *Izvestiia Akademii Nauk SSSR, Seriia Geofizicheskaia,* 1953, no. 5, p. 405-417.

Magnetite specimens subjected to uniaxial compression. Results. Graphs, diagram. 17 ref. (P16)

91-P. (Russian.) **Determination of the Direction of Magnetization of Disturbed Bodies According to the Results of Magnetic Survey.** D. S. Mikov. *Izvestiia Akademii Nauk SSSR, Seriia Geofizicheskaia,* 1953, no. 5, p. 418-423.

Method expounded for two-dimensional bodies. Importance for interpretation of magnetic survey data. Graph, table. (P16)

92-P. (Russian.) **Chemistry of Metal Alloys.** I. I. Kornilov. *Priroda,* v. 42, no. 10, Oct. 1953, p. 16-23.

Importance of Mendeleev periodic chart in predetermining nature of interaction between metals and metalloids. Tables, graphs, micrographs. (P13)

93-P. **Activity Coefficients of Oxygen and Phosphorus in Iron-Oxygen-Phosphorus Melts.** J. Pearson and E. T. Turkdogan. *Iron and Steel Institute, Journal,* v. 176, Jan. 1954, p. 19-23.

Molten Fe-O-P alloys have been equilibrated at temperatures between 1572 and 1624° C. with hydrogen-water-vapor mixtures of known composition. Tables, graphs, diagram. 23 ref. (P12, Fe)

94-P. **A Thermodynamic Study of the Iron, Cobalt, and Nickel Sulphides.** Terkel Rosenqvist. *Iron and Steel Institute, Journal,* v. 176, Jan. 1954, p. 37-57; disc. p. 57-58.

Results are discussed with emphasis on their connection with structure of different phases and nature of interatomic binding forces. Graphs, tables, diagram. 40 ref. (P12, M25, Fe, Co, Ni)

95-P. **A Radio-Frequency Permeameter.** Peter H. Haas. *Journal of Research, National Bureau of Standards,* v. 51, Nov. 1953, p. 221-228.

An instrument is described which is capable of measuring permeability and losses in ferromagnetic toroidal cores. Diagrams. 5 ref. (P16)

96-P. **Surface Brightness of Sheet Aluminium.** J. F. G. Hérenguel. *Metal Treatment and Drop Forging,* v. 21, Jan. 1954, p. 25-28, 48.

Survey and appraisal of various techniques. Diagram, tables, graphs, photographs. (P17, Al)

97-P. Volatile Platinum Oxide and Silicide. R. E. Carter and F. D. Richardson. *Research (Supplement),* v. 7, Jan. 1954, p. 3-5.

Results of experimental studies on loss of platinum from thermocouples. Graphs. 3 ref. (P15, Pt)

98-P. (English.) **The Influence of Cold Work and Radiation Damage on the Debye Temperature of Copper.** D. Bowen and G. W. Rodeback. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 649-653.

Simultaneous measurements of resistance were made on a damaged wire and a well-annealed wire. Differing behavior of temperature-dependent portions of resistivities has been interpreted as a decrease of Debye temperature in the damaged sample. Graphs, diagram. 7 ref. (P15, Cu)

99-P. (English.) **Heat Capacity and Resistance Measurements for Aluminum and Lead Wires.** T. E. Pochapsky. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 747-751.

Both heat capacities and temperature coefficients of resistance increase with temperature in such a way as to suggest that they are influenced by a single activated process rather than by impurities. Graphs, tables. 11 ref. (P11, Al, Pb)

100-P. (English.) **Thermodynamics of Surface Adsorption.** J. W. Stout. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 753-754.

Disputes Spretnak and Speiser's surface adsorption equation. 3 ref. (P10, P12)

101-P (English.) **Magnetic and Crystallographic Studies on the Higher Antimonies of Iron, Cobalt and Nickel.** Terkel Rosenqvist. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 761-763.

Small deviations between observed and theoretical magnetic moments and between observed and calculated values for the Sb-Sb distance are regarded as a result of a transition toward metallic binding, whereby some of the valency electrons are promoted to an electron gas or conduction band. Graphs, tables. 4 ref. (P16, M26, Fe, Co, Ni, Sb)

102-P. (German.) **Development and Status of Soft-Magnetic Materials.** Hermann Fahlenbrach and Walter Heister. *Stahl und Eisen,* v. 73, no. 25, Dec. 3, 1953, p. 1644-1652.

A literature review. Effects of composition, purity, and field strength on magnetic properties of metals and oxides. Graphs, diagrams. 81 ref. (P16, SG-p)

103-P. (Polish.) **Production of Silicon Sheets of High Initial Permeability.** M. Markuszewicz and A. Zawada. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 5, Sept.-Oct. 1953, p. 259-276.

Properties of silicon sheets for use in telecommunication systems. Effect of metallurgical and structural factors on magnetic permeability in low fields. Tables, graphs, micrographs, diagram. 17 ref. (P16, Si, ST)

104-P. (Polish.) **Apparatus for Determination of Magnetic Anisotropy.** L. Kozlowski, M. Poziomska and E. Romer. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 5, Sept.-Oct. 1953, p. 277-284.

Operating principles of apparatus designed to establish torque diagrams and texture of disks of cold rolled silicon strips. Graphs, tables, photographs, diagrams. 16 ref. (P16, AY)

105-P. (Russian.) **Criteria of Similarity of Phenomena of the Surface Effect in Ferromagnetic Bodies.** I. M. Kirko. *Doklady Akademii Nauk SSSR,* v. 93, no. 6, Dec. 21, 1953, p. 1029-1031.

Effects of weak and strong fields on magnetic permeability. Graphs. 9 ref. (P16)

106-P. Effects of Band Shape on the Magnetic and Thermal Properties of Metals and Alloys. E. W. Elcock, P. Rhodes, and A. Teviotdale. *Royal Society, Proceedings,* v. 221, ser. A, Jan. 7, 1954, p. 53-77.

Temperature variations of electronic contributions to paramagnetic susceptibility and specific heat of metals calculated for various forms of electron energy bands. Results are applied to experimental data for palladium and palladium-silver alloys. Graphs, diagrams. 19 ref. (P16, P12, M25, Pd, Ag)

107-P. Rate of Reduction of Iron Oxides. E. P. Tatievskaya, G. I. Chufarov and V. K. Antonov. Henry Brutcher, Altadena, Cal., Translation no. 3074, 9 p. (Condensed from *Zhurnal Fizicheskoi Khimii,* v. 24, no. 4, 1950, p. 385-393.)

Investigation into variation in equilibrium pressure of oxygen during dissociation of Fe_2O_3, Fe_3O_4, and FeO. Tables, graphs, 4 ref. (P12, Fe)

108-P. Magnesium-Cadmium Alloys. V. Low Temperature Heat Capacities and a Test of the Third Law of Thermodynamics for the MgCd Suuperlattice. C. B. Satterthwaite, R. S. Craig and W. E. Wallace. **VI. Heat Capacities Between 12 and 320° K. and the Entropies at 25° of Magnesium and Cadmium.** R. S. Craig, C.

A. Krier, L. W. Coffer, E. A. Bates and W. E. Wallace. **VII. Low Temperature Heat Capacities of $MgCd_3$ and Mg_3Cd and a Test of the Third Law of Thermodynamics for the $MgCd_3$ Superlattice.** L. W. Coffer, R. S. Craig, C. A. Krier and W. E. Wallace. *American Chemical Society, Journal,* v. 76, Jan. 5, 1954, p. 232-244.

Apparatus, techniques and results. Diagrams, tables. 38 ref.
(P12, Mg, Cd)

109-P. Effect of Temperature on Iron Powder Cores. George Katz. *Electrical Manufacturing,* v. 53, Feb. 1954, p. 135-137.

Heat tests on two types of high-frequency cores show changes in Q that may affect performance where close tolerances are required. Photograph, graphs, table.
(P15, H11, Fe)

110-P. Thermal Diffusivity of Metals at High Temperatures. P. H. Sidles and G. C. Danielson. *Journal of Applied Physics,* v. 25, 1954, p. 58-66.

Modified Ångström method for measuring thermal diffusivity and hence thermal conductivity of metals has been developed. Photographs, diagrams, graphs. 13 ref.
(P11)

111-P. A Method of Measuring Magnetostriction. A. W. Cochardt. *Journal of Applied Physics,* v. 25, Jan. 1954, p. 91-95.

Values derived from torsion tests made on wires of various ferromagnetic materials. Graphs, diagram, table. 11 ref.
(P16, Fe, Ni, Co, Al, Cr)

112-P. Some Magnetostriction Relations in Materials Possessing Preferred Domain Orientations. George T. Rado. *Journal of Applied Physics,* v. 25, Jan. 1954, p. 102-106.

Relations between magnetostrictive strains derived for polycrystalline ferromagnetic materials. Tables, diagram. 9 ref.
(P16, Ni, Fe, Co, Al)

113-P. Some Properties of Sodium and Potassium Near Their Melting Points. L. G. Carpenter. *Journal of Chemical Physics,* v. 21, Dec. 1953, p. 2244-2245.

Examines common model for resistance, diffusion and specific heat phenomena. Graphs. 8 ref.
(P12, Na, K)

114-P. Life of Silver-Surfaced Contacts on Repetitive Arcing Duty. W. R. Wilson. *Power Apparatus and Systems,* 1953, no. 9, Dec., p. 1236-1243; disc., p. 1243.

An investigation of the breakdown point of silver under varied conditions. Photographs, tables, diagrams, graphs. 5 ref. (P15, S21, Ag)

115-P. Electronic Eigenvalues of Copper. D. J. Howarth. *Royal Society, Proceedings,* v. 220, ser. A, Dec. 22, 1953, p. 513-529.

Electronic wave functions and eigen values at points of high symmetry in Brillouin zones of metallic copper. Tables, graphs, diagrams. 20 ref. (P15, Cu)

116-P. Basic Diagrams of Composition vs. High-Temperature Strength. *Metal Progress,* v. 65, Feb. 1954, p. 184-185. (Digest of "Basic Types of Diagrams of Composition Versus High-Temperature Strength in Metallic Systems", I. I. Kornilov, *Doklady Akademii Nauk SSSR,* v. 86, 1952, p. 721-724.

Previously abstracted from original. See item 436-P, 1953.
(P11, SG-h)

117-P. Nuclear Magnetic Resonance in Metals. II. Temperature Dependence of the Resonance Shifts. B. R. McGarvey and H. S. Gutowsky. *Journal of Chemical Physics,* v. 21, Dec. 1953, p. 2114-2119.

Temperature dependence of nuclear resonance shift in metals investigated in lithium, sodium, rubidium, cesium and gallium. Graphs. 20 ref.
(P16, Li, Na, Rb, Cs, Ga)

118-P. Thermal Neutron Resonance of Sm. A. W. McReynolds and E. Andersen. *Physical Review,* v. 93, ser. 2, Jan. 1, 1954, p. 195-196.

Total neutron cross section was measured. Agreement with Breit-Wigner one-level resonance formula was good. Graphs, table. 5 ref.
(P10, Sm)

119-P. The d^3 and d^4 Configurations of Vanadium. Sydney Meshkov. *Physical Review,* v. 93, ser. 2, Jan. 15, 1954, p. 270-272.

Term values of d^3 configuration of vanadium III calculated using experimentally observed energies of d^4 configuration of vanadium II. An iterative type calculation is then made for term values of d^4 in terms of both experimental energies of d^3 and calculated values of the still unidentified terms of d^3. Each of these calculations leads to an appreciable improvement of the agreement between calculated and observed energies. Tables. 6 ref. (P12, M26, V)

120-P. Cross Sections for Formation of Na^{22} From Aluminum and Magnesium Bombarded With Protons. R. E. Batzel and G. H. Coleman. *Physical Review,* v. 93, ser. 2, Jan. 15, 1954, p. 280-282.

Cross sections for formation of sodium-22 from proton bombardment of aluminum and magnesium have been determined for energy range from thresholds to 32 m.e.v. Graphs, table. 8 ref.
(P10, Na, Al, Mg)

121-P. A Calculation of the Eigenvalue of Electronic States in Metallic Lithium by the Cellular Method. B. Schiff. *Physical Society, Proceedings,* v. 67, no. 409A, Jan. 1954, p. 2-8.

Potential function computed for lithium ion core; cohesive energy of metallic lithium is found; and eigen values for conduction electrons in metallic lithium are calculated. Tables, graphs. 17 ref.
(P15, Li)

122-P. Momentum Distribution of Electrons in Solids: Results for Some Metals Using the Thomas-Fermi Method. N. H. March. *Physical Society, Proceedings,* v. 67, no. 409A, Jan. 1954, p. 9-16.

Experimental results show that momentum distribution of the electrons in metallic lithium and beryllium differs from that given by wave-mechanical calculations. Graphs. 12 ref.
(P15, Li, Be, Na, K, Rb)

123-P. The Magnetic Susceptibility of Metallic Uranium. L. F. Bates and D. Hughes. *Physical Society, Proceedings,* v. 67, no. 409B, Jan. 1954, p. 28-37.

Sudden changes in susceptibility accompany the alpha-beta and beta-gamma phase changes at 600 and 767° C. respectively. Diagram, graphs, tables. 12 ref. (P16, U)

124-P. Intrinsic Magnetization in Platinum Cobalt Alloys. A. W. Simpson and R. H. Tredgold. *Physical Society, Proceedings,* v. 67, no. 409B, Jan. 1954, p. 38-41.

Effect of heat treatment on alloys containing small percentages of cobalt. Graphs. 6 ref.
(P16, Pt, Co)

125-P. The Effect of Method of Preparation on the High-Frequency Surface Resistance of Metals. R. G. Chambers and A. B. Pippard. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. Institute of Metals, p. 281-294; disc., p. 295-364.

High-frequency behavior of metal, particularly surface resistance, determined by properties of thin surface layer of the order of micron in thickness. Graphs, table. 15 ref.
(P15)

126-P. (English.) **The Anomalous Skin Effect and the Reflectivity of Metals. IV. Theoretical Optical Properties of Thin Metallic Films.** R. B. Dingle. *Physica,* v. 19, no. 12, Dec. 1953, p. 1187-1199.

Reflection, transmission and absorption coefficients of a thin metallic film may be determined theoretically when due account is taken of the anomalous nature of the skin effect. Table, 9 ref. (P17)

127-P. (German.) **Anisotropic Changes in Size Due to Heat Treatment of Ledeburite Chromium Toolsteels.** Josef Frehser. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 483-494; disc., p. 494-495.

Experimental results show that causes of anisotropic size change from hardening and tempering can be expressed in general principles. Tables, graphs, diagrams, micrographs. 38 ref.
(P10, J26, J29, TS)

128-P. (German.) **Permanent Magnets of Barium Oxide and Trivalent Iron Oxide.** Hermann Fahlenbrach and Walter Heister. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 523-527; disc., p. 527-528.

Reviews literature on magnetic properties, advantages and disadvantages. Application. Graphs, photographs. 23 ref. (P16, Ba, Fe)

129-P. (German.) **Investigation of the Mechanism of Electric Conductivity of Gray Tin.** G. Busch and J. Wieland. *Helvetica Physica Acta,* v. 26, nos. 7-8, Sept.-Oct. 1953, p. 697-730.

Results interpreted by existing theory. Absolute value determined. Tables, graphs. 18 ref. (P15, Sn)

130-P. (German.) **Problem of Activation of Metal Surfaces.** Cyrill Schaub and Werner Liedtke. *Zeitschrift für Metallkunde,* v. 44, no. 12, Dec. 1953, p. 570-572.

Blackening of photographic plate in an electric field is due partly to electron emission and partly to H_2O_2 formed by chemosorption during cold working of metals. Photographs. 7 ref. (P13, P15, G general)

131-P. (German.) **The Properties of Metal Melts. VIII. The Density of Molten Aluminum and Several Aluminum Alloys.** Erich Gebhardt, Manfred Becker and Stefan Dorner. *Zeitschrift für Metallkunde,* v. 44, no. 12, Dec. 1953, p. 573-575.

Results of density determinations on pure aluminum and aluminum-copper, aluminum-iron and aluminum-titanium alloys performed by the buoyancy process in salt melt of known density. Graphs, tables.
(P10, Al)

132-P. Lattice Defects and the Electrical Resistivity of Metals. T. Broom. *Advances in Physics,* v. 3, Jan. 1954, p. 26-83.

Theory and extensive experiments. Tables, graphs, diagram. 146 ref. (P15, M26)

133-P. The Formation of Powder and Its Dependence on Crystal Face During the Catalytic Reaction of Hydrogen and Oxygen on a Single Crystal of Copper. J. Bruce Wagner, Jr., and Allan T. Gwathmey. *American Chemical Society, Journal,* v. 76, Jan. 20, 1954, p. 390-391 + 2 plates.

Results of experimental studies. Photographs, micrographs. 7 ref. (P13, M26, Cu)

134-P. The Thermal and Electrical Conductivity of Copper at Low Temperatures. G. K. White. *Australian Journal of Physics,* v. 6, Dec. 1953, p. 397-404.

Measurements of thermal conductivity from 2 to 160° K. and electrical conductivity from 1.4 to 293° K. of copper in strained and annealed states. Diagram, graphs. 16 ref. (P11, P15, Cu)

135-P. The Effect of Tension on the Thermoelectric Properties of Metals. A. J. Mortlock. *Australian Journal of Physics,* v. 6, Dec. 1953, p. 410-419.

Measurements made on 11 different metals of the change in thermo-electric power accompanying elastic tensile strain. Tables, graphs, diagram. 16 ref. (P15, Q21)

136-P. The Index of Refraction of Germanium Measured by an Interference Method. D. H. Rank, H. E. Bennett and D. C. Cronemeyer. *Optical Society of America, Journal,* v. 44, Jan. 1954, p. 13-16.

High-precision determination of index of refraction in 2.0-2.4 μ region is presented. Tables, diagrams. 6 ref. (P17, Ge)

137-P. Infrared Index of Refraction of Tellurium Crystals. Patricia A. Hartig and Joseph J. Loferski. *Optical Society of America, Journal,* v. 44, Jan. 1954, p. 17-18.

Results for single-crystal samples having 10^{17} impurity atoms per cc. Table. 5 ref. (P17, Te)

138-P. On the Validity of Mott's Theory of the Beta-Flow in Polycrystals. Paul Feltham. *Philosophical Magazine,* v. 45, 7th ser., no. 360, Jan. 1954, p. 9-12.

Surveys experimental evidence on activation energy for transient creep. Table. 12 ref. (P13)

139-P. The Thermal and Electrical Conductivity of Magnesium at Low Temperatures. H. M. Rosenberg. *Philosophical Magazine,* v. 45, 7th ser., no. 360, Jan. 1954, p. 73-79.

Electrical and thermal resistivities of the same specimen have been measured together between 2 and 35° K. Graphs. 12 ref. (P11, P15, Mg)

140-P. An Attempt to Find Anisotropy in the Superconductive Properties of Gallium. A. J. Croft, J. L. Olsen-Baer and R. W. Powell. *Philosophical Magazine,* v. 45, 7th ser., no. 361, Feb. 1954, p. 123-125.

Experiments in temperature range 0.2 to 1° K. show that dependence of superconductive transition point on crystallographic direction is less than 0.002° K. 6 ref. (P15, Ga)

141-P. Electronic Conduction in Grey Tin. J. T. Kendall. *Philosophical Magazine,* v. 45, 7th ser., no. 361, Feb. 1954, p. 141-157.

Conductivity and Hall constant of gray-tin alloys containing antimony and gallium were measured over a temperature range of 77 to 286° K. Tables. graphs, diagram. 9 ref. (P15, Ga, Sn)

142-P. Antiferromagnetism of Manganese. Lyle Patrick. *Physical Review,* v. 93, ser. 2, Feb. 1, 1954, p. 370.

Measurements of resistance and thermo-electric power of manganese show anomalies near Neél temperature. Evidence of a manganese transition at 100° K. Graph. 3 ref. (P16, P15, Mn)

143-P. The Change of Ferromagnetic Curie Points With Hydrostatic Pressure. Lyle Patrick. *Physical Review,* v. 93, ser. 2, Feb. 1, 1954, p. 384-392.

Measurements on effect of pressure on Curie temperature for 13 ferromagnetic materials. Table, graphs, diagrams. 23 ref. (P16, Si, Fe, Co, Ni, Gd)

144-P. The Influence of Pressure on the Curie Temperature of Iron and Nickel. R. Smoluchowski. *Physical Review,* v. 93, ser. 2, Feb. 1, 1954, p. 392-393.

Comparison between Patrick's measurements of change of Curie temperature under pressure and theory based on a Brillouin function. 5 ref. (P16, Ni, Fe)

145-P. A New Method for Measuring Auger Transitions. Charles E. Roos. *Physical Review,* v. 93, ser. 2, Feb. 1, 1954, p. 401-405.

Fluorescence yields of zirconium, niobium, molybdenum, rhodium, palladium, silver, cadmium and tin measured by a new X-ray method involving use of a scintillation counter. Graphs, diagrams, tables. 26 ref. (P17, Zr, Nb, Mo, Rh, Pd, Ag, Cd, Sn)

146-P. Thermo-Electricity at Low Temperatures. II. The Alkali Metal Group. D. K. C. MacDonald and W. B. Pearson. *Royal Society, Proceedings,* v. 221, ser. A, Feb. 9, 1954, p. 534-540.

Measures in detail the thermoelectric behavior of all alkali metals, together with some alloys, in low-temperature region below 80° K. Graphs. 8 ref.
(P15, Li, Na, K, Rb, Cs)

147-P. Effect of Heat-Treatment on the Magnetic Properties of Cold Worked 18-8. Samuel Storchheim. *Wire and Wire Products,* v. 29, Feb. 1954, p. 147-148, 149-150.

Results of experimental studies. Tables, graphs. (P16, SS)

148-P. A New Semi-Automatic Apparatus for Measurement of Specific Heats and the Specific Heat of Sodium Between 55 and 315° K. T. M. Dauphinee, D. K. C. MacDonald and H. Preston-Thomas. *Royal Society, Proceedings,* v. 221, ser. A, Jan. 21, 1954, p. 267-276.

Apparatus and results for sodium. Graphs, diagrams. 9 ref. (P12, Na)

149-P. (English.) **Activity of Iron in Iron-Platinum Solid Solutions.** Hugo R. Larson and John Chipman. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 1-2.

Data on contamination of platinum by iron from melts consisting of calcium oxide and iron oxides under controlled conditions of known activity of iron and oxygen. Diagram, graph, table. 4 ref.
(P12, Fe, Pt)

150-P. (English.) **Effect of Neutron Irradiation on a Supersaturated Solid Solution of Beryllium in Copper.** G. T. Murray and W. E. Taylor. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 52-62.

Effects on electrical resistivity, hardness, X-ray line shape and position and density of a solution annealed copper-beryllium alloy. Graphs, tables. 14 ref.
(P10, P15, Q29, Be, Cu)

151-P. (English.) **The Change in Resistivity, on Plastic Deformation, of Silver-Copper and Silver-Gold Alloys.** W. H. Aarts and R. K. Jarvis. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 87-91.

Wires of silver, gold, copper, silver-copper and silver-gold alloys were stretched at room temperature, −80° C. and at liquid air point. Change of resistivity was determined as well as recovery of resistivity on warming from low temperatures to room temperature. Graphs, tables. 7 ref.
(P15, Q24, Cu, Au, Ag)

152-P. (English.) **The Anomalous Skin Effect and the Reflectivity of Metals. IV. Theoretical Optical Properties of Thin Metallic Films.** R. B. Dingle. *Physica,* v. 19, no. 12, Dec. 1953, p. 1187-1199.

Mathematical analysis. Table. 5 ref. (P17)

153-P. (French.) **New Invariance of the Gage of Electromagnetism and Superconductivity.** Bernard Jouvet. *Comptes rendus,* v. 238, no. 4, Jan. 25, 1954, p. 454-456.

New definition of electromagnetic potential and new invariance of electro-neutrino magnetism facilitates proof of London's equations and understanding of superconductivity mechanism. 4 ref. (P16)

154-P. (German.) **A New Effect in the Electrolytic Transfer in Solid Alloys.** W. Seith and H. Wever. *Zeitschrift für Elektrochemie,* v. 57, no. 10, 1953, p. 891-900.

Solid electrolysis experiments with copper-aluminum alloys between two copper electrodes reveal that displaced atoms of the alloys move toward the cathode independently. Tables, graphs, diagrams, micrographs. 12 ref. (P15, Al, Cu)

155-P. (German.) **On the Age-Hardening of Aluminum-Silver Alloys. VIII. Measurement of the Hall Constants and Magnetic Susceptibility.** Werner Köster and Adolf Frei. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 495-502.

Effect of heat-treating on Hall constants and magnetic susceptibility of an aluminum-silver alloy with 3.9% copper and 0.5% silicon investigated as means of studying the age hardening process. Experiments described and results evaluated. Graphs, tables. 10 ref.
(P15, P16, N7, Al, Ag)

156-P. (Russian.) **Theory of Electroconductivity of Metals at Low Temperatures.** A. I. Rezanov. *Doklady Akademii Nauk SSSR,* 92, no. 5, Oct. 11, 1953, p. 935-937.

Compares additional electroresistance caused in ferromagnetic metals by mechanism of transfer of energy of external 4-s to internal 3-d electrons with the ordinary "phonon" effect. Derives kinetics equation for electroconductivity of these metals. 4 ref. (P15)

157-P. (Russian.) **Influence of Nitrogen on Surface Tension and Crystallization of Austenitic Steel.** N. S. Kreshchanovskii, V. I. Prosvirin and R. P. Zaletaeva. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 23-24.

Concludes that presence of nitrogen shows no appreciable influence on primary crystallization. Table, graph, micrographs. 6 ref. (P10, N12, AY)

158-P. Electrical Measurements at High Temperatures as an Efficient Tool for Thermal Analysis. F. W. Glaser and D. Moskowitz. *Powder Metallurgy Bulletin,* v. 6, Dec. 1953, p. 178-185.

Apparatus for measurement of electrical resistivities of bar samples at elevated temperatures. Graphs, diagram, photograph. 10 ref. (P15)

159-P. Contribution to the Theory of Surface Tension of Metals. S. M. Zadumkin. *Henry Brutcher, Altadena, Calif., Translation no.* 3172, 6 p. (From *Zhurnal Fizicheskoi Khimii,* v. 27, no. 4, 1953, p. 502-504.)

Previously abstracted from original. See item 65-P, 1954. (P10, P12)

160-P. (English.) **On Activities of Coexisting Elements in Molten Iron. II. The Activity of Silicon in Molten Fe-Si System.** Koji Sanbongi and Masayasu Ohtani. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 4, Aug. 1953, p. 350-357.

Electromotive force corresponding to change of silicon content in iron was measured in an electrode concentration cell. Diagram, graphs, tables. 11 ref. (P12, Fe, Si)

161-P. (English.) **Ferromagnetic Domain Patterns on Nickel Crystals. I. Domain Patterns on the Magnetically Important Surfaces of Unmagnetized Nickel Crystals.** Mikio Yamamoto and Takao Iwata. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 5, Oct. 1953, p. 433-459.

The (110) surface of nickel crystals showed plate, tree and parallelogram-net patterns. Pattern observed on (211) surface was simple while those on (100) and (111) surfaces were much more complicated. Dot and deformed maze patterns were observed on disturbed surfaces. Micrographs, diagrams. 30 ref. (P16, Ni)

162-P. (German.) **The Quantum Theory on a New Cause of Ferromagnetism.** G. Heber. *Annalen der Physik,* v. 13, nos. 1-5, Oct. 1953, p. 44-72.

Theoretical discussion. Interaction of 3d and 4s electrons of a crystal as a cause of ferromagnetism. Approximate determination of statistical averages for spontaneous magnetization and energy of crystals at low temperatures. Graphs, table. 17 ref. (P16, Fe, Ni, Co)

163-P. (German.) **Electrical Conductivity of the Solid Solutions of Intermetallic Compounds.** G. Busch and U. Winkler. *Helvetica Physica Acta,* v. 26, no. 6, 1953, p. 578-583.

Solid solutions of magnesium-germanium-tin system investigated for their lattice constants and electrical conductivities. 9 ref. (P15, Mg, Ge, Sn)

164-P. (German.) **The Magnetic Properties of Semiconducters With Special Consideration of Gray Tin.** G. Busch and E. Mooser. *Helvetica Physica Acta,* v. 26, no. 6, 1953, p. 611-656.

Measurement of magnetic susceptibility of tin and of tin contaminated with foreign atoms of different kind from room temperature to −200° C. Diagrams, tables, graphs. 24 ref. (P16, Sn)

165-P. (German.) **Magnetic Investigations on the Nature of the Cumuli in the Precipitate from the Cu-Fe System.** A. Knappwost and G. E. Bockstiegel. *Zeitschrift für Elektrochemie,* v. 57, no. 8, 1953, p. 700-709.

Magnetic measurements on copper-iron solid solutions quenched from 1030° C. and tempered at above 600° C. show the meta-stability of supersaturated solution is apparent. Graphs, diagrams, table. 27 ref. (P16, N12, Cu, Fe)

166-P. (German.) **Research on the Relationship of Hydrogen Overvoltage and Catalytic Effectiveness of Metal Surfaces.** E. Cremer and R. Kerber. *Zeitschrift für Elektrochemie,* v. 57, no. 8, 1953, p. 757-762.

Catalytic effectiveness of nickel, copper, cobalt and copper-zinc and nickel-iron-molybdenum alloys and rate of electrolytic hydrogen dissociation at same overvoltage. Diagrams, graphs, tables. 22 ref. (P15, Ni, Co, Cu, Zn, Fe, Mo)

167-P. (German.) **The Boundary-Layer Theory of Chemisorption. A Contribution to the Explanation of Processes at the Solid-Gas Surface of Contact.** H. J. Engell and K. Hauffe. *Zeitschrift für Elektrochemie,* v. 57, no. 8, 1953, p. 762-773.

Effect of chemisorption on electrical conductivity and electron-work function of metals and semiconductors. Graphs, diagrams, 23 ref. (P13, P15)

168-P. (German.) **High-Frequency Conductivity of Hexagonal Selenium.** H. Rebstock and K. Seiler. *Zeitschrift für Naturforschung,* v. 9a, no. 1, Jan. 1954, p. 49-55.

Measurements of conductivity of test pieces tempered at 217° C. for various times and with various iodine content. Diagrams, graphs. 21 ref. (P15, Se)

169-P. Magnetic Permeability of So-Called "Non-Magnetic" Metallic Materials. M. R. Gross. *American Society of Naval Engineers, Journal,* v. 66, Feb. 1954, p. 215-245.

Many "nonmagnetic" materials exhibit feeble but measurable magnetic properties such as permeability, coercive force and residual induction. Graphs, table, diagrams, photographs. 5 ref. (P16)

170-P. The Heat of Sublimation of Tin and the Dissociation Energy of SnO. Leo Brewer and Richard F. Porter. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 2012-2013.

Value for tin combined with heat of formation of gaseous tin oxide agrees with Birge-Sponer extrapolation to ground-state atoms. Tables. 11 ref. (P12, Sn)

171-P. The Vibrational Spectrum and the Specific Heat of Germanium and Silicon. Yü-Chang Hsieh. *Journal of Chemical Physics,* v. 22, Feb. 1954, p. 306-311.

Substances with diamond structure such as diamond, germanium, silicon and gray tin show that variations of the Debye characteristic temperature can be very large. Tables, graphs. 15 ref. (P12, Ge, Si)

172-P. Electrical Properties of N-Type Germanium. P. P. Debye and E. M. Conwell. *Physical Review,* v. 93, ser. 2, Feb. 15, 1954, p. 693-706.

Measurements of conductivity and Hall effect from 11 to 300° K on samples covering range from intrinsic to degenerate. Graphs, table. 26 ref. (P15, Ge)

173-P. Structural Defects in Copper and the Electrical Resistivity Minimum. T. H. Blewitt, R. R. Coltman, Jr., and J. K. Redman. *Physical Review,* v. 93, ser. 2, Feb. 15, 1954, p. 891.

Role of structural defects, especially grain boundaries, in resistivity minimum found in copper. Table. 4 ref. (P15, M27, Cu)

174-P. Absorption Cross Sections for 134 MeV Protons. J. M. Cassels and J. D. Lawson. *Physical Society, Proceedings,* v. 67, no. 410A, Feb. 1954, p. 125-133.

Absorption cross sections of carbon, aluminum, copper, cadmium and lead measured by a transmission method. Graphs, table, diagram. 30 ref. (P10, Al, Cu, Cd, Pb)

175-P. The Thermal Conductivity of Monovalent Metals. P. G. Klemens. *Physical Society, Proceedings,* v. 67, no. 410A, Feb. 1954, p. 194-196.

Two solutions of integral equation for Bloch's theory of thermal conductivity. 11 ref. (P11)

176-P. Effect of Magnetic Field on the Precipitation of Ferromagnetic Phase. Syohei Miyahara and Tadayasu Mitui. *Hokkaido University, Faculty of Science, Journal, ser. II.* v. 41, Nov. 1953, p. 275-286.

Behavior of ferromagnetic precipitates in nonferromagnetic phase and mechanism of heat treatment in magnetic field (i. e., so-called field cooling). Micrograph, graphs, diagram. 6 ref. (P16, Cu, Co)

177-P. (English.) **Measurements on the Electrical Resistivity of Thin Nickel Films at Very Low Temperatures.** A. Van Itterbeek, L. De Greve, L. Van Gerven and K. Sabbe. *Physica,* v. 20, no. 1, Jan. 1954, p. 1-6.

Resistance was very sensitive to temperature and measuring current. Hysteresis demonstrated. Graphs, tables. 8 ref. (P15, Ni)

178-P. (French.) **The Photomagnetic-Electric Effect on Germanium.** Hubert Bulliard. *Annales de physique,* v. 9, 12 me Serie, Jan.-Feb. 1954, p. 52-83.

Studies on action of light, diffusion and recombination. Action of magnetic field. Diagrams, graphs. 9 ref. (P16, P17, Ge)

179-P. (German.) **Causes for Deviations of the Magnetizing Processes From Raleigh's Law in the Case of Low Field Intensities.** Günther Sorger. *Frequenz,* v. 8, no. 2, Feb. 1954, p. 41-47.

Interpretation of deviations observed in soft silicon-iron plate. Agreement of hypothesis with measurements of dependence of permeability and shape of hysteresis loop upon field intensity. Graphs, table. 14 ref. (P16, AY)

180-P. (Russian.) **Electrical Resistance and Transparency of Films of Mg-Sb, Mg-Bi, and Mg-Sn Alloys.** G. A. Kurov. *Doklady Akademii Nauk SSSR,* v. 94, no. 2, Jan. 11, 1954, p. 207-208.

Investigates vapor-deposited films on glass plates of various dimensions. Film thicknesses varied up to 40 microns. Deposition was at a pressure of 10^{-5} mm. of mercury. (P15, P17, Sb, Sn, Bi, Mg)

181-P. (Russian.) **Action of a Constant Electric Field on a Suspension of Metals and Semiconductors in Liquid Dielectrics.** L. G. Gindin, I. N. Putilova and L. M. Moroz. *Doklady Akademii Nauk SSSR,* v. 94, no. 2, Jan. 11, 1954, p. 277-279.

Behavior of suspensions of platinum and copper powders and certain semiconductors. Diagram. 4 ref. (P15, Pt, Cu)

182-P. (Russian.) **Experimental Investigation of Surface Tension of So-**

dium Amalgams. P. P. Pugachevich and O. A. Timofeevicheva. *Doklady Akademii Nauk SSSR,* v. 94, no. 2, Jan. 11, 1954, p. 285-287.

Experimental investigations of surface tension of 56 sodium amalgams containing from 8×10^{-5} to 0.284 at. % of sodium. Measurements were performed at 22° C. under high vacuum. Graphs. 10 ref. (P10, Na, Hg)

183-P. On a Nonlinear Diffusion Equation Applied to the Magnetization of Saturable Reactors. Shou-Hsien Chow. *Journal of Applied Physics,* v. 25, Mar. 1954, p. 377-381.

Solution for cases of finite and infinite slabs of ferromagnetic material. Graphs. 2 ref. (P16, N1)

184-P. Heat Transfer Measurements at Sodium-Stainless Steel Interface. James W. Moyer and William A. Riemen. *Journal of Applied Physics,* v. 25, Mar. 1954, p. 400-402.

Experiments measure heat-transfer coefficient at a sodium-stainless steel (Type 347) interface. Diagrams. (P11, Na, SS)

185-P. Theory of Displacement of Domain Boundaries. N. S. Akulov and G. S. Krinchik. *National Science Foundation Translation, no.* 106, Nov. 1953, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 809-812.)

Displacement in ferromagnet under simultaneous action of external magnetic field and opposing fields. 7 ref. (P16)

186-P. On the Theory of Electrical Conductivity of Ferromagnetic Metals at Low Temperatures. A. I. Rezanov. *National Science Foundation Translation, no.* 206, Feb. 1954, 3 p. (From *Doklady Akademii Nauk SSSR,* v. 92, no. 5, Oct. 11, 1953, p. 935-937.)

Previously abstracted from original. See item 156-P, 1954. (P15)

187-P. Appearance Measurements. Reflectance. E. S. Beck. *Organic Finishing,* v. 15, Mar. 1954, p. 9-14.

Various instruments for measuring and evaluating reflectance. Diagrams, graphs, photograph. (To be continued.) (P17)

188-P. Magnetic Behaviour of Thin Single-Crystal Nickel Films. L. E. Collins and O. S. Heavens. *Philosophical Magazine,* v. 45, 7th ser., no. 362, Mar. 1954, p. 283-289 + 1 plate.

Coercivity of monocrystalline films grown epitaxially on (100) face of rock salt studied as function of thickness over range 200 to 1000 Å. Graphs. 9 ref. (P16, Ni)

189-P. Thermal Conductance of Contacts in Aircraft Joints. Martin E. Barzelay, Kin Nee Tong and George Hollo. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3167, Mar. 1954, 47 p.

Factors influencing thermal conductance across interface between aluminum alloy and stainless steel structural joints. Graphs, diagrams, tables, photographs. 9 ref. (P11, Al, SS)

190-P. (French.) **Thermo-Electric Properties of Bismuth.** Jean Savornin and André Poggi. *Comptes rendus,* v. 238, no. 6, Feb. 8, 1954, p. 656-657.

Systematic measurements made of thermoelectric power of bismuth associated with copper. Graphs. (P15, Bi, Cu)

191-P. (French.) **Influence of Very Low Impurity Content on Electric Conductivity of Refined Aluminum at Very Low Temperatures.** Michel Caron, Philippe Albert and Georges Chaudron. *Comptes rendus,* v. 238, no. 6, Feb. 8, 1954, p. 686-688.

Measurements made on specimens of 99.95 to 99.998% purity at temperatures ranging from 2.2 to 80° K. Shows stronger effect on samples with highest purity. Graphs, table. (P15, Al)

192-P. (German.) **The Magnetization in Iron-Silicon Crystals.** Bruno Elschner. *Annalen der Physik,* v. 13, nos. 6-8, Dec. 15, 1953, p. 290-304.

Elementary magnetic zones in vicinity of grain boundaries and natural and artificially introduced impurities. Diagrams, micrographs. 17 ref. (P16, Fe, Si)

193-P. (German.) **Local Tendency of Change of Solution Pressure of Metals Under Slight Stresses.** Paul Koch. *Metalloberfläche,* Edition A, v. 8, no. 3, Mar. 1954, p. 37-41.

Metallographic, magnetic and ultrasonic investigation of elastic and plastic deformations on thin microtensile specimens. Change in potential with stress applied in one of two steel springs immersed in an electrolyte. Diagrams, graphs, micrographs. (To be continued.) (P13, ST)

194-P. (German.) **Expansion of Spin-Wave Theory of Ferromagnetism to Higher Temperatures.** G. Heber. *Zeitschrift für Naturforschung,* v. 9a, no. 2, Feb. 1954, p. 91-97.

Elimination of several approximation assumptions results in improvements in statistical evaluation of energy spectrum and better temperature dependence. Graphs. 5 ref. (P16)

195-P. (German.) **Transverse Electromagnetic Effects in Semiconductors.**

J. Appel. *Zeitschrift für Naturforschung,* v. 9a, no. 2, Feb. 1954, p. 167-174.

Theoretical investigation of effects with mixed impulse time and for two-band model on conductivity, resistance and Hall constants. Graphs. 7 ref. (P15, P16, Ge)

196-P. (Italian.) **The Solution of Metal Monocrystals in Acids. Determinations on Aluminum, Lead, and Zinc.** Giampaolo Bolognesi. *Metallurgia italiana,* v. 46, no. 1, Jan. 1954, p. 9-12.

Importance where surface reactivity is essential. Use in electrochemical surface reproduction. Photographs, graph. 8 ref. (P13, P15, Al, Pb, Zn)

197-P. An Ionization Manometer and Control Unit for Extremely Low Pressures. P. A. Redhead and L. R. McNarry. *Canadian Journal of Physics,* v. 32, Apr. 1954, p. 267-274.

Bayard-Alpert type ionization manometer for measurement of pressures as low as 10^{-10} mm. of mercury. Methods for increasing sensitivity. Diagrams, graphs. 4 ref. (P12)

198-P. Surface Reaction Between Oxygen and Thorium. A. F. Gerds and M. W. Mallett. *Electrochemical Society, Journal,* v. 101, Apr. 154, p. 171-174.

Rate of reaction of oxygen with arc-melted and rolled iodide thorium has been found to obey parabolic rate law in temperature range 850 to 1415° C. at one atmosphere pressure. Diagram, graphs, table. 13 ref. (P13, Th)

199-P. The Melting of Gallium. J. Jach and F. Sebba. *Faraday Society, Transactions,* v. 50, Mar. 1954, p. 226-231.

Differential thermal analysis and very slow heating rate shows that gallium does not have a sharp melting point. Graphs. 6 ref. (P12, Ga)

200-P. Magnetic Susceptibilities of Np^{+6}, Np^{+5}, and Np^{+4}. Dieter M. Gruen and Clyde A. Hutchison, Jr. *Journal of Chemical Physics,* v. 22, Mar. 1954, p. 386-393.

Susceptibilities of ions compared with those calculated for ions in electronic states of *f*-electron configurations in presence of electric fields of specific forms and with various amounts of spin-orbit coupling. Table, graphs. 23 ref. (P16, Np)

201-P. Electronic Structure, Infrared Absorption, and Hall Effect in Tellurium. Herbert B. Callen. *Journal of Chemical Physics,* v. 22, Mar. 1954, p. 518-522.

Analysis of band structure of tellurium based on symmetry properties of a drastically simplified model of its crystal structure. Symmetry considerations lead to suggestions of physical mechanisms underlying variety of experimental facts. Diagrams, tables. 9 ref. (P15, M26, Te)

202-P. Hartree-Fook-Slater Self-Consistent Field and the Calculation of Some Properties of the Cu^+ Ion. J. C. Morrow. *Journal of Physical Chemistry,* v. 58, Mar. 1954, p. 245-247.

Calculation of diamagnetic susceptibility, polarizability and refractivity, Lamb diamagnetic shielding at the nucleus and structure factors for X-ray and fast electron scattering. Tables. (P16, Cu)

203-P. (Russian.) **Calculation of Total Electrical Resistance of Multi-Wire Steel Conductors.** A. M. Ganelin. *Elektrichestvo,* 1953, no. 11, Nov., p. 59-60.

Shows necessity of introducing correction coefficients. Graph. (P15, ST)

204-P. (Russian.) **Measurement of Small Vapor Pressures at High Temperatures. IV. Partial Vapor Pressures of Components in the System Silver-Lead. V. Partial Vapor Pressures of Components in the System Iron-Phosphorus.** A. A. Granovskaia and A. P. Lieubimov. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 10, Oct. 1953, p. 1437-1445.

Evaporation from an open surface and utilization of radioactive isotopes. Tables, graphs, diagram. 3 ref. (P12, Ag, Pb, Fe)

205-P. (Russian.) **Migration and Distribution of Components of Metal Alloys in an Electric Field.** S. I. Drakin. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 10, Oct. 1953, p. 1586-1591.

State of equilibrium and kinetics of electrodiffusion. Differences of average ion charges in various alloys. Graphs, table. 18 ref. (P15, N1)

206-P. (Book.) **The Actinide Elements.** Glenn T. Seaborg and Joseph J. Katz, editors. National Nuclear Energy Series IV-14A. 870 p. 1953. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y. $11.75.

Chemistry and nuclear properties of actinium, uranium, protactinium, thorium, plutonium, neptunium, americium, curium and their isotopes. (P10, P13, EG-h)

207-P. (Book.) **Heat Transfer Symposium, Engineering Research Institute.** 286 p. 1953. University of Michigan Press, Ann Arbor, Mich. $5.00.

One of a series on fundamental engineering topics. (P11)

208-P. Rapid Measurements of Thermal Diffusivity. G. E. McIntosh, D. C. Hamilton and W. L. Sibbit. *ASME, Transactions*, v. 76, Apr. 1954, p. 407-409; disc., p. 409-410.

Apparatus and technique developed for determining thermal diffusivity of metals by a periodic heat-flow method. Graph, diagrams. 14 ref. (P11, Ti, Zr, Fe)

209-P. Electrical Properties of Microcrystalline Selenium. Gilbert Halverson. *Communication and Electronics*, 1954, Mar., p. 38-45.

Resistivity and temperature variation of resistivity for temperature range 25 to 150° C. on selenium samples conaining iodine. Table, graphs, micrographs. 7 ref. (P15, Se)

210-P. Influence of pH on the Corrosion of Metals. (Digest of "Influence of pH on the Electrochemical Behavior of Metals and Their Corrosion Resistance", A. Ya. Shatalov; *Doklady Akademii Nauk SSSR*, v. 86, 1952, p. 775-777.) *Metal Progress*, v. 65, Apr. 1954, p. 174, 176, 178.

Previously abstracted from original. See item 437-P, 1953. (P15, R general, Ag, Cu, Mg, Zn, Cd, Al, Pb, Sn, Bi, Mo, W, Mn)

211-P. Properties of Sintered Nickel Steels. (Digest of "Sintered Nickel Steels", F. Benesovsky; *Berg und Hüttenmännische Monatshefte*, v. 96, Sept. 1951, p. 184-187.) *Metal Progress*, v. 65, Apr. 1954, p. 200, 202, 204.

Previously abstracted from original. See item 30-P, 1952. (P10, Q27, Q29, M27, AY)

212-P. Some Physical Properties of Metallic Plutonium. W. B. H. Lord. *Nature*, v. 173, Mar. 20, 1954, p. 534-535.

Includes transition temperatures, phase densities and coefficients of linear thermal expansion and electrical resistance. Tables. (P11, P15, Pu)

213-P. Thermoelectric Power of Cold-Worked Copper at Low Temperature. M. J. Druyvesteyn and K. J. Blok van Laer. *Nature*, v. 173, Mar. 27, 1954, p. 591.

Thermoelectric force measured between wire drawn at room temperature and an annealed wire as function of temperature of hot junction. Cold junction was kept at liquid air temperature (83° K). Graphs. 2 ref. (P15, Cu)

214-P. Measurement of the Hall Coefficient of Alpha and Beta-Brass. O. Gram Jeppesen. *Nature*, v. 173, Mar. 27, 1954, p. 591-592.

Measurements undertaken to determine if any pronounced change in Hall coefficient takes place when passing from alpha to beta-brass. Method employing d.c. was used. Graph. 4 ref. (P15, Cu)

215-P. Thermodynamic Properties of Liquid Sodium. John F. Lee. *Nucleonics*, v. 12, Apr. 1954, p. 74, 76-77.

Table at 5° F. temperature intervals over a temperature range 208 to 1500° F. Shows how data were obtained or calculated. Tables. 5 ref. (P12, Na)

216-P. Infrared Absorption, Photoconductivity, and Impurity States in Germanium. W. Kaiser and H. Y. Fan. *Physical Review*, v. 93, ser. 2, Mar. 1, 1954, p. 977-980.

Measurements for *p*-type germanium with gold and copper impurities were conducted at different temperatures. Graphs, table. 8 ref. (P15, P17, Ge)

217-P. The Work Function of Irregular Metal Surfaces. T. J. Lewis. *Physical Society, Proceedings*, v. 67, no. 411B, Mar. 1, 1954, p. 187-200.

Image potential of an electron outside an irregular metal surface differs from that for an ideal plane surface. Importance in theory of electron emission from metals in practice is briefly discussed. Graphs. 15 ref. (P15)

218-P. Justification of the Use of Perturbation Theory in Metallic Conductivity. J. S. van Wieringen. *Physical Society, Proceedings*, v. 67, no. 411A, Mar. 1954, p. 206-216.

Correction terms for scattering by two centers are calculated and shown to be negligible for Fermi gas. Diagrams. 10 ref. (P11)

219-P. Nuclear Magnetic Resonance in Metallic Lithium and Sodium. H. Jones and B. Schiff. *Physical Society, Proceedings*, v. 67, no. 411A, Mar. 1954, p. 217-220.

Observed 'Knight-shifts' are in agreement with results of cellular-type calculations of electronic states in metallic lithium and sodium. Tables. 12 ref. (P16, Li, Na)

220-P. The Scattering of Slow Neutrons by Ferromagnetic Crystals. G. L. Squires. *Physical Society, Proceedings*, v. 67, no. 411A, Mar. 1954, p. 248-253.

Beam of filtered neutrons with wave length of 7.0 A was used to measure total cross section of nickel and iron as a function of temperature from 290 to 1170° K. Graphs, diagram. 12 ref. (P10, Fe, Ni)

221-P. The Elastic Constants and Density of Palladium Silver Alloys. F. E. Hoare and B. Yates. *Physical Society, Proceedings,* v. 67, no. 411B, Mar. 1, 1954, p. 266-267.

Exploratory investigation of Young's modulus, rigidity and density for a series of palladium-silver alloys, including the pure metals. Graphs. 6 ref. (P10, Q21, Pd, Ag)

222-P. The Thermal Conductivity of Metals. R. E. B. Makinson. *Physical Society, Proceedings,* v. 67, no. 411A, Mar. 1954, p. 290-291.

Investigates Sondheimer's equations on conductivity of a monovalent metal. 2 ref. (P11)

223-P. Determination of Heat Capacity by Pulse Heating. T. E. Pochapsky. *Review of Scientific Instruments,* v. 25, Mar. 1954, p. 238-242.

Method is advantageous over more conventional procedures in that the heating can be done so rapidly that thermal losses become a minor problem. Photograph, diagrams. 5 ref. (P12)

224-P. An Apparatus for the Determination of the Solidus Temperatures of High-Melting Alloys. R. A. Oriani and T. S. Jones. *Review of Scientific Instruments,* v. 25, Mar. 1954, p. 248-250.

Apparatus determines melting temperatures of alloys up to 2200° C. within 10° and precludes possibility of contamination from refractory container. Table, diagram, photograph. 3 ref. (P12)

225-P. Contribution to the Theory of the Coercive Force of Steel. E. Kondorskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3221, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 63, no. 5, 1948, p. 507-510.)

Previously abstracted from original. See item 3B-78, 1949. (P16, ST)

226-P. On the Theory of the Coercive Force of Low Carbon Steels. E. Kondorskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3239, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 68, no. 1, 1949, p. 37-40.)

Previously abstracted from original. See item 3B-276, 1949. (P16, CN)

227-P. (English.) **The Magnetic Susceptibility and Electronic Specific Heat of Transition Metals in Relation to Their Electronic Structure.** E. C. Stoner. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 259-273.

Collective electron treatment of specific heat and susceptibility. Expressions obtained for main relations in form suitable for application to experimental results. Graphs, tables. 37 ref. (P16, P12)

228-P. (English.) **The Effect of Lattice Anisotropy on Low-Temperature Specific Heat.** W. DeSorbo. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 274-283.

General analysis in terms of Debye theory. Lattice vibration specific heat of monatomic lattices, both isotropic and anisotropic, are compared in liquid hydrogen-liquid nitrogen temperature region. Graphs, tables. 73 ref. (P12)

229-P. (English.) **On the Energies of Alkali Halide Solid Solutions.** Väinö Hovi. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 334-339.

Heats of formation and evolution are calculated on basis of Wasastjerna's statistical theory for solutions, in which difference between interionic equilibrium distances of components is equal to or smaller than case of NaCl-NaBr. Tables, graphs. 41 ref. (P12)

230-P. (English.) **Electron and Photocurrents in Thin Films of ZrO_2.** D. A. Vermilyea. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 346-348.

Mechanism to account for observed variation. Probability of tunneling versus that of thermal excitation over a barrier is considered. Graphs. 3 ref. (P15, Zr)

231-P. (French.) **The Variation of Magnetic Permeability of Irons and Steels as a Function of Mechanical Stresses.** Jean Creusot. *Comptes rendus,* v. 238, no. 11, Mar. 15, 1954, p. 1203-1204.

Variation of magnetic induction of specimens subjected to constant magnetic field. 5 ref. (P16, Q25, CI, ST)

232-P. (French.) **The Overvoltage of Copper in a Solution of Copper Acetate.** Minko Balkanski. *Comptes rendus,* v. 238, no. 11, Mar. 15, 1954, p. 1221-1223.

Studies on an ordinary out-of-phase apparatus by measuring potential of a copper electrode on electrolytically polished copper plate dipped in a 10-molar solution of copper acetate. Graphs. 1 ref. (P15, Cu)

233-P. (German.) **Principles of Measuring Radiated Power. Wave Length Norms in the Visible Spectrum.** H. Korte. *Archiv für technisches Messen,* 1954, no. 218, Mar., p. 57-60.

Wave lengths of a variety of metals under different atmospheric conditions. Tables. 7 ref. (P17)

234-P. (German.) **The Magnetic Susceptibility of Chromium.** Friedrich Wagenknecht. *Zeitschrift für anor-*

ganische und allgemeine Chemie, v. 275, nos. 1-3, Feb. 1954, p. 59-64.

Preparation, analysis and magnetic measurement of electrolytic chromium. Tables, graph. 16 ref. (P16, Cr)

235-P. (German.) **Antiferromagnetic States of Precipitates in the Cu-Fe System.** A. Knappwost. *Zeitschrift für Elektrochemie,* v. 58, no. 1, 1954, p. 65-66.

Magnetic measurements indicate relation to gamma state of the iron. 7 ref. (P16, Fe, Cu)

236-P. (German.) **The Temperature Dependence of Residual Resistance in Tungsten in Temperature Range of 14 to 373° K.** Erich Krautz and Hermann Schultz. *Zeischrift für Naturforschung,* v. 9a, no. 2, Feb. 1954, p. 125-129.

Investigates deviations from Matthiessen's rule of electrical resistance. Temperature-dependence of cold-deformed wires agrees with Kohler's theory. Graph, tables. 11 ref. (P15, W)

237-P. Measurements on the Coercive Force of Ticonal Down to Liquid Helium Temperatures. D. A. Lockhorst, A. van Itterbeek and G. J. van den Berg. *Applied Scientific Research,* v. 3, sec. B, no. 6, 1954, p. 451-455.

Hysteresis curves compiled for magnetic induction as function of magnetic field strength, up to saturation, at different fixed temperatures by means of ballistic induction method. Table, graphs, diagram. 8 ref. (P16, Ni, Co, Al, Fe)

238-P. The Free Energy of Formation of Manganous Orthophosphate. J. Pearson, E. T. Turkdogan and E. M. Fenn. *Iron and Steel Institute, Journal,* v. 176, Apr. 1954, p. 441-444.

Reduction of manganous orthophosphate by hydrogen studied within 680 to 870° C. Results used to calculate standard free-energy change. Graphs, tables. 12 ref. (P12, Mn)

239-P. The Electronegativities and Some Electron Affinities of Copper, Zinc, and Gallium Subgroup Elements. Aubrey P. Altshuller. *Journal of Chemical Physics,* v. 22, Apr. 1954, p. 765-766.

Thermochemical method is used in calculations. Results compared to Gordy's empirical method. Table. 7 ref. (P15, Ga, Cu, Zn)

240-P. Exchange Energy of Electrons in Metals and Ionic Crystals. John R. Reitz. *Journal of Chemical Physics,* v. 22, Apr. 1954, p. 595-598.

Energy of valence electrons in monatomic and diatomic crystals is computed in Bloch approximation for case where lowest electronic wave function in band shows considerable spatial variation. Graph. 11 ref. (P12)

241-P. Magneto-Resistance of Copper to 150,000 Oersted at 4.2° K. J. L. Olsen and L. Rinderer. *Nature,* v. 173, Apr. 10, 1954, p. 682.

Extends measurements at liquid-helium temperatures to field-strengths of approximately 150,000 oersted. Graph. 5 ref. (P16, Cu)

242-P. Furnace Spectrum of Plutonium. John G. Conway. *Optical Society of America, Journal,* v. 44, Apr. 1954, p. 276-278.

Spectrum from a modified King furnace was observed between 3476 and 6888 A. at temperatures of 2000 to 2600° C. Table, diagram, spectrogram. 3 ref. (P17, Pu)

243-P. The Magnetic Susceptibility of Nd Metal. J. F. Elliot, S. Legvold and F. H. Spedding. *Physical Review,* v. 94, ser. 2, Apr. 1, 1954, p. 50-51.

Susceptibility of neodymium over temperature range of 20.4 to 300° K. Low-field susceptibility at 20.4° K. is larger than predicted by low-temperature Curie-Weiss law and has a definite field dependence. Graph, table. 9 ref. (P16, Nd)

244-P. Effect of Elastic Strain on the Electrical Resistance of Metals. G. C. Kuczynski. *Physical Review,* v. 94, ser. 2, Apr. 1, 1954, p. 61-64.

Coefficients of electrical resistivity of 18 metals and alloys determined experimentally. For most metals, free electron theory accounts qualitatively for observed effects. Tables, graphs. 21 ref. (P15)

245-P. Theoretical Remarks on the Influence of Slight Heterogeneous Impurities on the Initial Permeability of Nickel-Iron Alloys. Martin Kersten. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 1-8; disc., p. 8.

Formula shows satisfactory agreement with experimental data. Graph, diagram. (P16, Ni, Fe)

246-P. Coercivities in Dilute Ferromagnetic Alloys. G. Bate, D. Schofield and W. Sucksmith. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 9-13; disc., p. 13-14.

Tests on 12% chromium, 12% nickel stainless steel and copper-cobalt alloys containing 0.5 to 2.0% cobalt. Graphs, table. (P16, SS, Cu)

247-P. The Influence of Subdivision Into Elementary Domains on the High-Frequency Permeability of Ferromagnetic Conducting Bodies. L. Néel. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 15-18.

Theoretical computation based on superficial layers composed of elementary domains. Graphs. (P16)

248-P. The Cardinal Magnitudes of Technical Magnetization. G. C. Richer. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 19-26.

Model based on integration of two normal Gaussian distributions illustrates "eddy-loss" anomaly can be related to shape of hysteresis loop. Tables. (P16)

249-P. Iron Losses Under Superimposed Alternating Inductions. J. Greig and H. V. Shurmer. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 27-36; disc., p. 36-37.

Shows total loss may be greater or less than sum of losses when reentrant minor loops are formed. Graphs, diagrams, table. (P16, Fe)

250-P. Non-Linearity in Magnetic Core Materials at Low Field Strengths. K. E. Latimer. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 38-49; disc., p. 49-50.

Theoretical survey of types of non-linearity to be expected. Ferrites included. Diagrams, graph. (P16, Fe)

251-P. Frequency-Dependence of Magnetization Processes in Ferrites and Its Relation to the Distortion Caused by Ferrite Cores. H. P. J. Wijn. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 51-62; disc., p. 62-63.

Magnetization curves of ferrites measured as function of frequency. Two dispersion mechanisms found. Graphs, table. (P16, Fe, Zn)

252-P. Physical Aspects of Losses in Soft Magnetic Materials. D. Polder. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 74-82; disc., p. 82-89.

Unambiguous classification into hysteresis, eddy-current, and residual losses is difficult. Ignorance of process results in unsatisfactory definitions. Tables, graphs. (P16, SG-p)

253-P. Ferromagnetic Resonances, Hysteresis and Residual Losses in Ferrites and Metals. F. F. Roberts. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 90-95; disc., p. 95, 82-89.

Attempts to connect theory of spin-precision resonance and domain-wall resonance inside magnetic domains. (P16)

254-P. Relaxation Phenomena in Carbonyl Iron. T. A. Dunton. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 96-106; disc., p. 86, 106.

Magnetic after-effects occurring in carbonyl iron and theory of temperature-dependent after-effects. Graphs, table. (P16, Fe)

255-P. Richter-Type After-Effect of the Permeability in Silicon-Iron Laminations. R. Feldtkeller. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 107-118; disc., p. 86, 119.

After-effect is accompanied by limiting of initial field strength for smallest Barkhausen jumps and an anomalous hysteresis-free increase of permeability with amplitude of a.c. field. Diagrams, graphs. (P16, Si, Fe)

256-P. Jordan-Type After-Effect (Residual Loss) in Powder-Cores. R. Feldtkeller. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 120-128; disc., p. 86, 129.

Method suggested by Jordan for separating the eddy current and residual losses is critically analyzed. Graphs. (P16)

257-P. The Thermal-Agitation After-Effect. J. C. Barbier. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 130-134; disc., p. 86.

Analyzes hypothesis stated by Néel. Measurements of variations of magnetization as function of time throughout hysteresis range show existence of irreversible after-effect. Tables, diagram. (P16)

258-P. A Study, With the Aid of Electropolishing, of the Behaviour of Soft Magnetic Materials Over a Wide Frequency Range. I. Epelboin. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 135-144; disc., p. 188.

Deals with nickel-iron alloys having low magnetostriction. Behavior at radio frequencies and results of polishing. Graphs. (P16, Fe, Ni)

259-P. On the Theory of Residual and Stratification Losses. A. Fairweather. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 145-152.

Conventional theory of eddy losses in magnetic materials criticized.

Stratification loss for a few core shapes at frequencies such that shielding is negligible. Graph, diagrams. (P16)

260-P. A Calorimetric Method of Finding the Total Loss in Ferromagnetic Specimens Subjected to an Alternating Magnetic Field. L. F. Bates, A. V. Davies and D. J. Harper. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 153-159; disc., p. 159-160.

Direct method measures total heat losses in strip, tube or rod specimens under conditions of high flux-density. Diagrams, graphs. (P16, SG-p)

261-P. A Screening-Factor Technique for Permeability Determination and Some Experimental Results. F. F. Roberts. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 161-171; disc., p. 171.

Simple probe units for impressing and picking up exploring wave. Theory of attenuation caused by insertion of specimen outlined. Tables, diagram. (P16)

262-P. Irreversible Magnetic-Viscosity Effects. R. Street and J. C. Woolley. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 172-182.

Theory of activation energy of irreversible magnetic viscosity is applied to two cases of varying fields. Graphs, diagrams. (P16)

263-P. The Assessment of Inhomogeneity in Thin Strips of High-Permeability Alloys. A. C. Lynch. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 183-187; disc., p. 187-190 + 1 plate.

Permeability of layers near surface of strips measured using frequencies so high that flux penetrates no further than layers in question. Tables, micrograph. (P16, Fe, Ni)

264-P. Some Problems of Oscillographic Measurement of Characteristics of "Rectangular"-Loop Magnetic Materials. G. R. Jackson, W. S. Melville and D. W. R. Sewell. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 191-196.

Techniques for determining a.c. dynamic characteristics. Diagrams. (P16, SG-p)

265-P. Experimental Investigations on Nickel-Molybdenum-Iron Alloys With Extremely High Initial Permeability. Fritz Assmus. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 218-224.

Reproduction of Supermalloy, "softest" magnetic material. Shows similar effects can be obtained with other alloys. Graphs. (P16, Ni, Fe, Cu, Mo)

266-P. The Properties and Potentialities of Cold-Reduced Nickel-Iron. W. F. Randall and H. H. Scholefield. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 225-232 + 3 plates.

Effect of progressive cold reduction on structure and magnetic properties of 50-50 and 80-20 alloy types. Graphs, tables, micrographs. (P16, Ni, Fe)

267-P. Some Chemical and Physical Properties of Iron Powders and Their Effects on the Magnetic Properties. C. E. Richards. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 233-242; disc., p. 242-246.

Study of influences controlling performance of iron powder. Pointers to be considered in future work. Tables, graphs. (P16, H11, Fe)

268-P. Factors Influencing the Measured Value of Hysteresis Loss of Powder-Cores. P. R. Bardell. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 253-257; disc., p. 257-258.

Influence of flux-density, magnetic history, annealing, insulant, particle-size and internal discontinuities in particles. Tables. (P16, H11, SG-p)

269-P. Some Properties and Applications of Silicon-Iron. J. McFarlane and N. F. Mole. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 259-267.

Reviews important properties of nonoriented and oriented alloys and application to magnetic circuits. Graphs, diagrams. (P16, T1, Si, Fe)

270-P. A Laminated Flake-Iron Powder Material for Use at Audio and Ultrasonic Frequencies. G. Campbell and F. J. Wood. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 268-277 + 2 plates.

Material in present form, method of manufacture, and properties and applications. Micrographs, photograph, graphs, table. (P16, H11, T1, Fe)

271-P. Some Pulse Tests on Magnetic Specimens Having Rectangular Hysteresis Loops. P. F. Dorey. Paper from "Soft Magnetic Materials

for Telecommunications". Pergamon Press Ltd., p. 286-299; disc., p. 299-300.

A circuit theory based on eddy currents flowing within a core is ideally expressed. Helps predict time and energy required to saturate a core and limiting conditions for flux transfer. Graphs, diagrams. (P16, SG-p)

272-P. Magnetic Cores for Instrument Transductors. A. E. De Barr and E. H. Frost-Smith. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 301-312.

Core material should have high permeability, sharp saturation and good linearity. Proposed figure-of-merit is shown to assess available materials reasonably. Graphs, table. (P16, SG-p)

273-P. Some A.C. Measurements on a Material Having a Rectangular Hysteresis Loop. S. E. Buckley, G. A. Jackson and A. G. F. Thomas. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 313-319; disc., p. 319-321.

Analysis of core-loss coefficients at low values of applied field shows eddy-current loss is greater than expected while hysteresis-loss coefficient increases with frequency. Tables, graphs. (P16, Ni, Fe)

274-P. The Magnetostriction of Ferrites. P. Popper. Paper from "Soft Magnetic Materials for Telecommunications". Pergamon Press Ltd., p. 322-332.

Ferrites compared with nickel. Equations and properties of ring vibrating in radial mode. Diagrams, graphs, tables. (P16, Ni)

275-P. (English.) **Thermodynamical Theory of Galvanomagnetic and Thermomagnetic Phenomena. I. Reciprocal Relations in Anisotropic Metals.** R. Fieschi, S. R. De Groot and P. Mazur. *Physica,* v. 20, no. 2, Feb. 1954, p. 67-76.

Relations derived for heat and electric conduction, and cross-effects in presence of a magnetic field. 11 ref. (P16)

276-P. (French.) **Electrochemical Dissolution of a Metal in Presence of an Anion That Precipitates the Metallic Cation Formed. Equation of Polarization Curve.** J. Badoz-Lambling. *Bulletin de la société chimique de France,* 1954, no. 3, Mar., p. 370-375.

Studies of silver halogenides were in qualitative agreement with established equations. Tables, graphs. 21 ref. (P13)

277-P. (French.) **Paramagnetism and Distribution of Electrons in Definite Compounds $NiAl_3$, $CoAl_4$, $FeAl_3$, $MnAl_6$, and $CrAl_7$.** Gabriel Foex and Jules Wucher. *Comptes rendus,* v. 238, no. 12, Mar. 22, 1954, p. 1281-1283.

Results of magnetic measurement to determine negative valence. Tables. (P16, Ni, Al, Mn, Co, Fe, Cr)

278-P. (French.) **Measuring Absolute Temperature of a Metallic Conductor From Electric Voltage Produced by Agitation of Electrons.** Roger Aumont, Jacques Romand and Boris Vodar. *Comptes rendus,* v. 238, no. 12, Mar. 22, 1954, p. 1293-1296.

Principle, apparatus and results of measurements to 780° K. Graph. 1 ref. (P15)

279-P. (French.) **Magnetic and Dilatometric Study of $CeMg_2$ Formation.** Francoise Gaume - Mahn and Micheline Cohen. *Comptes rendus,* v. 238, no. 12, Mar. 22, 1954, p. 1302-1303.

$CeMg_2$ prepared by prolonged heating of mixture of CeMg and $CeMg_3$ below 600° C. Existence of $CeMg_2$ indicated by sharp changes in magnetic and expansion coefficients. Graph. 4 ref. (P16, Ce, Mg)

280-P. (French.) **Alpha Magnetic Spectrum of Thorium C and Thorium C'.** A. Rytz. *Journal des recherches du centre national de la recherche scientifique,* 1953, no. 25, Dec., p. 254-256.

Confirms existence of $alpha^5$ in alpha-spectrum of thorium C. Energies and intensities of all alpha-groups of thorium B and C. Table, diagrams. 9 ref. (P16, Th)

281-P. (German.) **The Eddy-Current Anomaly in Sheet-Metal Cores.** Günther Sorger. *Frequenz,* v. 8, no. 3, Mar. 1954, p. 83-91.

Effects of eddy current on complex permeability computed. Frequent deviations from computed values are caused by inhomogeneity of local permeability and by zonal structure of ferromagnetism. Diagrams, graphs, table. 12 ref. (P16)

282-P. (German.) **Ionization by Strong Electrical Fields.** F. Kirchner. *Naturwissenschaften,* v. 41, no. 6, 1954, p. 136-137.

Study of adsorption of gases on metal surfaces reveals spontaneous ionization of adsorbed atoms and emission of electrons from adsorbed gas film. Graphs, micrograph. 10 ref. (P15)

283-P. (German.) **Paramagnetism During Precipitation in the System Copper-Iron.** Adolf Knappwost. *Zeitschrift für Metallkunde,* v. 45, no. 3, Mar. 1954, p. 137-142.

Magnetic moments of iron ions in copper lattice. Diagram, graphs, tables. (P16, Cu, Fe)

284-P. (German.) **Theory of Internal Field Emission of Cubic Crystals.** J. Homilius and W. Franz. *Zeitschrift für Naturforschung,* v. 9a, no. 3, Mar. 1954, p. 205-210.

Computation of disruptive strengths of body and face-centered crystals applied to various semiconductors. Field strengths are indicated. 10 ref. (P15, Pb, Si, Ge)

285-P. (German.) **Experimental Proof of the Semiconducting Character of Compounds CdTe and In_2Te_3.** J. Appel. *Zeitschrift für Naturforschung,* v. 9a, no. 3, Mar. 1954, p. 265-267.

Preparation of specimens and measurement of electrical conductivity of specimens from room temperature to 900 and 1100° K. Shows that saturation of outer atomic shells of each element imparts a distinct semiconducting character. Diagram, graphs. 4 ref. (P15, Cd, Te, In)

286-P. (German.) **Magnetization of Extremely Thin Iron Films.** W. Reincke. *Zeitschrift für Physik,* v. 137, no. 2, 1954, p. 169-174.

Vapor-deposited films were suspended on a silk fiber in magnetic field. Magnetic susceptibility computed from the duration of oscillations, moment of inertia of the glass plate and volume of deposited iron. Diagram, graphs. 15 ref. (P16, Fe)

287-P. (German.) **Ferromagnetism and Band Structure of the Transition Metals.** F. Bader, K. Ganzhorn and U. Dehlinger. *Zeitschrift für Physik,* v. 137, no. 2, 1954, p. 190-199.

Method designed explains that mathematics fails to show quantum-theoretically assumed abnormal change of the signs of the *d*-functions of ferromagnetic states. Diagrams, graphs, tables. 36 ref. (P16)

288-P. (German.) **Solubility of Hydrogen in Alloys. I. Method of Measuring and Investigation of $MgCu_2$-$MgZn_2$ and $MgNi_2$-$MgZn_2$ Systems.** K. H. Lieser and H. Witte. *Zeitschrift für physikalische Chemie,* v. 202, no. 5-6, Jan. 1954, p. 321-351.

Volumetric method of measuring solubility as function of time at constant pressure permits study of kinetic processes. Tables, graphs, diagram. (P13, Mg, Cu, Zn, Ni)

289-P. (German.) **Magnetic Susceptibilities of Ternary Magnesium Alloys and Their Importance From the Standpoint of the Electron Theory of Metals.** H. Klee and H. Witte. *Zeitschrift für physikalische Chemie,* v. 202, nos. 5-6, Jan. 1954, p. 352-378.

Brillouin's zone model explains susceptibility of electron gases. Results indicate a paramagnetic effect corresponding to anomalous diamagnetism. Tables, graphs, diagrams. 27 ref. (P16, Mg, Cu, Al, Si, Zr)

290-P. (Russian.) **Analysis of the Magnetization of Finite Ferromagnetic Cylinders in Constant Fields by the Method of the Theories of Dimensions and of Similarity.** V. G. Vitol and I. M. Kirko. *Doklady Akademii Nauk SSSR,* v. 93, no. 5, Dec. 11, 1953, p. 807-808.

Experimental data on cylinders of Armco iron, toolsteel and Steels A-12 and U-10. Graphs. 9 ref. (P16, Fe, TS, ST)

291-P. **Kinetics of the Reaction of Hydrogen With Zirconium.** Jack Belle, B. B. Cleland and M. W. Mallett. *Electrochemical Society, Journal,* v. 101, May 1954, p. 211-214.

Rate of reaction was determined for temperature range of 250 to 425° C. at one atmosphere pressure. Diagram, graphs, table, micrograph. 9 ref. (P13, Zr)

292-P. **A Refinement of the Pauling Theory of Ferromagnetism.** Gary Felsenfeld. *National Academy of Sciences of the United States of America, Proceedings,* v. 40, Mar. 1954, p. 145-149.

Method of modifying theory to take into account nonuniform electron density. Table. 2 ref. (P16)

293-P. **The Phase Transition in Superconductors. III. Phase Propagation Below the Critical Field.** T. E. Faber. *Royal Society, Proceedings,* v. 223, ser. A, Apr. 22, 1954, p. 174-194.

If superconducting nucleus is created at one end of a long rod of supercooled tin, it grows down to other end with a velocity of order 10 cm. per sec. Quantitative theory developed. Graphs, tables. 17 ref. (P15, N6, Sn)

294-P. (German.) **Sonic Velocities and Elastic Constants of Heterogeneous Substances.** H. Mandel. *Acustica,* v. 4, no. 2, 1954, p. 333-340.

Velocity of propagation of longitudinal and transverse waves in solid bodies measured by pulse method. Material constants derived. Application to alloys. Diagrams, graphs, photograph. 8 ref. (P10, Q21)

295-P. (German.) **The Disruptive Discharge Potential of Passive Iron-Chromium Alloys in Sulfate Solutions.** Georg Masing, Theo Heumann and Heinz Jesper. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 169-179; disc., p. 179-180.

Anodic behavior of iron, platinum, iron-chromium alloys and steel with 9.9% nickel and 18% chromium. Current density-voltage curves in potassium sulfate and sulfuric acid

solutions measured at 20, 45 and 70° C. Voltage curve investigated as function of time. Graphs, tables. 11 ref. (P15, Fe, Pt, SS)

296-P. (Hungarian.) **The Application of Thermodynamic Functions to Metallurgy. II.** Aurél Horvath. *Kohaszati Lapok,* v. 9, no. 3, Mar. 10, 1954, p. 109-114.

Variation of entropy function with volume, pressure and temperature. Application of function to solution of problems. Tables. (P12)

297-P. (Russian.) **Theory of Anomalous Skin Effect in a Magnetic Field.** M. Ia. Azbel and M. I. Kaganov. *Doklady Akademii Nauk SSSR,* v. 95, no. 1, Mar. 1, 1954, p. 41-44.

Reflection of a plane monochromatic wave from the surface of a metal in a permanent magnetic field. 4 ref. (P16)

298-P. Electrical Resistivity of Dilute Binary Terminal Solid Solutions. Walter R. Hibbard, Jr. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 594-602.

Published data used to establish theoretical relationships. Graphs, tables. 85 ref. (P15)

299-P. Photoconductivity in Gold-Germanium Alloys. Roger Newman. *Physical Review,* v. 94, ser. 2, Apr. 15, 1954, p. 278-285.

Results observed at 77 and 22° K in *n* and *p*-type gold-doped germanium. Interpretation of quenching data in terms of hole trap model. Graphs. 4 ref. (P15, Au, Ge)

300-P. Behavior of Ferromagnetic Domains Under Stress. G. Bonfiglioli, A. Ferro, G. Montalenti and G. Rosa. *Physical Review,* v. 94, ser. 2, Apr. 15, 1954, p. 316-318.

Analogy between effects of uniform magnetic field and static mechanical stress on motion of Weiss domains. Remanent strain and electrical resistivity variation reduced to zero by demagnetizing specimen. Graphs, diagram, table. 7 ref. (P16, Ni)

301-P. Electrical Properties of Pure Tellurium and Tellurium-Selenium Alloys. Allen Nussbaum. *Physical Review,* v. 94, ser. 2, Apr. 15, 1954, p. 337-342.

Resistivity and Hall coefficient of pure single crystals and six single crystal alloys, from 2.7 to 13.2% Se by wt. measured over range 90 to 550° K. Diagrams, table, graphs. 13 ref. (P15, Te, Se)

302-P. Effect of Hydrostatic Pressure on the Superconducting Transition of Tin and Thallium. Milan D. Fiske. *Physical Review,* v. 94, ser. 2, Apr. 15, 1954, p. 495-496.

Differences in threshhold fields of two single crystals measured. Pressure on one crystal held fixed while pressure on the other was varied by means of a tank of helium gas. Table. (P15, Sn, Th)

303-P. Resistivity Changes in Copper, Silver, and Gold Produced by Deuteron Irradiation Near 10° K. H. G. Cooper, J. S. Koehler and J. W. Marx. *Physical Review,* v. 94, ser. 2, Apr. 15, 1954, p. 496.

Wires 99.97 ± 0.02% pure were irradiated with 12-mev. deuterons. Tables. 3 ref. (P15, Cu, Ag, Au)

304-P. The Magneto-Resistance Effect in Metals at High Frequencies. B. Donovan. *Physical Society, Proceedings,* v. 67, no. 412A, Apr. 1, 1954, p. 305-314.

Effect of magnetic field on surface impedance of a metal in which there are two overlapping bands of normal form. Graphs. 15 ref. (P16, Bi)

305-P. The Electrical Properties of Indium Antimonide at Low Temperatures. J. Hatton and B. V. Rollin. *Physical Society, Proceedings,* v. 67, no. 412A, Apr. 1, 1954, p. 385-386.

Resistivity, Hall coefficient and magneto resistance coefficients of semiconducting compound over temperature range 300 to 1° K. Graphs. 3 ref. (P15, In, Sb)

306-P. The Optical Constants of Tin Below the Superconducting Transition Temperature. N. G. McCrum and C. A. Shiffman. *Physical Society, Proceedings,* v. 67, no. 412A, Apr. 1, 1954, p. 386-388.

Direct optical determination at 5890° A. 11 ref. (P17, Sn)

307-P. Fundamental Properties of Semiconducting Materials. Esther M. Conwell. *Sylvania Technologist,* v. 7, Apr. 1954, p. 41-44.

Conduction electrons and holes, impurities and defects in germanium and silicon. Diagram. 29 ref. (P15, Ge, Si)

308-P. Magnetic Materials. Eberhard Both. Paper from "Materials for Product Development 1953". Clapp & Poliak, p. 199-221; disc., p. 221-222.

Properties of new materials and their applications. Magnetic properties explained. Photograph, graphs. 14 ref. (P16, SG-n)

309-P. (French.) **Gyromagnetic Relationships of Ferromagnetic Substances of the Fe-Co-Ni Group and Experimental Results of S. J. Barnett.** Sheldon Brown and André J. P. Meyer.

Comptes rendus, v. 238, no. 14, Apr. 5, 1954, p. 1480-1482.

Includes graphs. 11 ref. (P16, Fe, Co, Ni)

310-P. (German and French.) **Reflection and Radiation Power of Aluminum Foil and Sheets With Different Surfaces.** F. Rohner. *Aluminium Suisse,* v. 4, no. 2, Mar. 1954, p. 66-69.

Measurements for white light and ultraviolet rays. Radiation of pure aluminum and Peraluman-15 sheets 1.5 mm. thick with various surface treatments. Tables, diagrams. (P17, Al)

311-P. (Russian.) **Dependence of Coersive Forces of Soft Magnetic Materials on Thickness of the Sheet.** V. A. Zaikova and Ia. S. Shur. *Doklady Akademii Nauk SSSR,* v. 94, no. 4, Feb. 1, 1954, p. 663-665.

Comparison of materials differing by the value and sign of their anisotropic and magnetostriction constants. Graphs, table. 3 ref. (P16, Fe, Ni, Si)

312-P. (Russian.) **Magnetization Processes Conditioning the Phenomenon of Thermal Magnetic Hysteresis in Ferromagnetics.** N. A. Baranova and Ia. S. Shur. *Doklady Akademii Nauk SSSR,* v. 94, no. 5, Feb. 11, 1954, p. 825-827.

Study of long, thin nickel wires in temperature range from −195 to +20° C. in permanent magnetic fields up to 59 oersteds. Graphs. 4 ref. (P16, Ni)

313-P. (Russian.) **The Magnetic Field of Steady Currents Found in Cavities or Channels Inside Iron With Infinitely High Permeability.** G. A. Grinberg. *Doklady Akademii Nauk SSSR,* v. 94, no. 5, Feb. 11, 1954, p. 839-842.

New and interesting theorems. Series of contradictions, inaccuracies and errors present in literature. 2 ref. (P16, Fe)

314-P. (Russian.) **Effective Depth of Secondary Electron Emission.** N. D. Morgulis and N. G. Nakhodkin. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1029-1032.

Investigations on silver, copper, chromium, antimony, bismuth, titanium, indium, tellurium and germanium; and on copper, lead, indium, tin-cesium and antimony-cesium after pretreatment in a vacuum. Table, graphs, diagram. 20 ref. (P15)

315-P. (Russian.) **Study of Energy Levels of Aluminum and Boron Nuclei by Magnetic Analysis.** L. M. Khromchenko. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1037-1040.

Values for Al^{28} and B^{11}. Tables, graphs. 10 ref. (P12, Al, B)

316-P. (Russian.) **Theory of Measuring Magnetic and Dielectric Permeability of Semiconductors and Ferromagnets.** K. M. Polivanov. *Doklady Akademii Nauk SSSR,* v. 95, no. 1, Mar. 1, 1954, p. 61-64.

Method for determining parameters using only two tests. Diagrams. 6 ref. (P16)

317-P. (Russian.) **Anisotropic Hall Effect in Tin.** E. S. Borovik. *Doklady Akademii Nauk SSSR,* v. 95, no. 3, Mar. 21, 1954, p. 485-487.

Measurements at 4.22° K. with consideration of potential differences, resistance changes and magnetic field magnitudes. Graphs. 9 ref. (P15, Sn)

318-P. (Russian.) **New Effect Caused by Gyromagnetic Phenomena.** K. M. Polivanov. *Doklady Akademii Nauk SSSR,* v. 95, no. 3, Mar. 21, 1954, p. 501-503.

Field on surface of a magnetodielectric plate placed near one side of wave guide during passage of wave. Diagram. 8 ref. (P16)

319-P. (Russian.) **Anisotropy of Magnetic Properties of Powdered Mn-Bi Alloy.** E. V. Shtol'ts and Ia. S. Shur. *Doklady Akademii Nauk SSSR,* v. 95, no. 4, Apr. 1, 1954, p. 781-784.

Magnitude of coercive intensity, residual magnetization, particle dimensions and hystersis loop. Graphs, table. 4 ref. (P16, H11, Mn, Bi)

320-P. **Heat Transfer to Lead-Bismuth and Mercury in Laminar and Transition Pipe Flow.** H. A. Johnson, J. P. Hartnett and W. J. Clabaugh. *ASME, Transactions,* v. 76, May 1954, p. 513-517.

Experimental results in low Reynolds modulus range of 1000 to 10,000. Graphs. 25 ref. (P11, Pb, Hg)

321-P. **Radiation in Metals.** N. W. Snyder. *ASME, Transactions,* v. 76, May 1954, p. 541-548.

A resumé on electromagnetic theory of radiation in metals. Graphs. 42 ref. (P16)

322-P. **The Magnetic and Electrical Properties of Cast Iron.** M. H. Hillman. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Apr. 1954, p. 188-248 + 48 plates.

Varying combinations of graphite and matrix structure. Remanent magnetism, coercive force, hysteresis loss, maximum permeability, specific resistance, etc., determined for 24 specimens. Tables, diagrams, graphs, micrographs. 26 ref. (P16, P15, CI)

323-P. A Comparison of Chemical and Electrolytic Methods of Reduction. M. G. Fouad and J. F. Herringshaw. *Chemical Society, Journal,* 1954, Apr., p. 1207-1212.

Relation exists between reduction by dissolving metals and electrolytic reduction. Rate of former process predicted from electrolytic reduction data. Tables. (P13, Zn, Cd)

324-P. The Heats of Vaporization of the Elements. E. C. Baughan. *Faraday Society, Transactions,* v. 50, Apr. 1954, p. 322-335.

Predictions about heats of vaporization not yet known with precision. Anomalies are pointed out. Tables, graph. 43 ref. (P12)

325-P. The Domain Structure of Ferromagnetic Metals. L. F. Bates. *Institute of Metals, Journal,* v. 82, May 1954, p. 417-425 + 6 plates.

Powder-pattern technique permits mapping of intersections of domain boundaries with suitably prepared surfaces. Graphs, diagrams, micrographs, photograph. 12 ref. (P16, Fe)

326-P. Resistivity Anomalies in the Nickel-Chromium System as Evidence of Ordering Reactions. Rolf Nordheim and Nicholas J. Grant. *Institute of Metals, Journal,* v. 82, May 1954, p. 440-444.

During long-time annealing at temperatures below 500° C., the resistivity of alloys with more than 30 at. % chromium decreases markedly. Effect is associated with long-range ordering, possibly of the CuAu type. Graphs. 9 ref. (P15, N10, Ni, Cr)

327-P. Some Factors Affecting the Dimensional Stability of the Silver-Tin-(Copper-Zinc) Amalgams. J. A. Mitchell, I. C. Schoonover, George Dickson and H. C. Vacher. *Journal of Research, National Bureau of Standards,* v. 52, Apr. 1954, p. 185-193.

X-ray investigation shows free mercury present after initial solidification. It disappeared during period of greatest dimensional change. Tables, graphs, diagrams, X-ray diffraction charts. 9 ref. (P10, N12, Ag, Sn, Cu, Zn)

328-P. A Cryoscopic Study of the Solubility of Uranium in Liquid Sodium at 97.8° C. Thomas B. Douglas. *Journal of Research, National Bureau of Standards,* v. 52, May 1954, p. 223-226.

Impurities lowered freezing points by approximately 0.035° C. Sodium containing finely divided uranium was found to have a freezing point higher by 0.005° C. Graph, table, diagram. 1 ref. (P12, U, Na)

329-P. Compressibilities of Crystalline and Glassy Modifications of Selenium and Glucose. Charles E. Weir. *Journal of Research, National Bureau of Standards,* v. 52, May 1954, p. 247-249.

Compressibilities of glassy form were larger than for crystalline. Graphs, table. 11 ref. (P10, Se)

330-P. On the Theory of Magnetic Susceptibility of Thin Layers of Metals at Low Temperatures. I. M. Lifshits and A. M. Kosevich. *National Science Foundation Translation, no.* 156, Jan. 1954, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 795-798.)

Previously abstracted from original. See item 42-P, 1954. (P16)

331-P. Latent Heat of Transition of Superconducting Lead. R. L. Dolecek. *Physical Review,* v. 94, ser. 2, May 1, 1954, p. 540-543.

Utilizing magnetic heating, calorimetric measurements of lead were obtained in range 2.5 to 7.0° K. Graphs, table, diagrams. 8 ref. (P12, Pb)

332-P. Resistance Anomalies in Some Rare-Earth Metals. R. J. Elliott. *Physical Review,* v. 94, ser. 2, May 1, 1954, p. 564-568.

Anomalies observed in lighter metals explained by simple model of interaction between conduction electrons and *f* electrons tightly bound to each atom. Graphs. 13 ref. (P15, Ce, Pr, Nd)

333-P. Hall Mobility of Electrons and Holes in Silicon. P. P. Debye and T. Kohane. *Physical Review,* v. 94, ser. 2, May 1, 1954, p. 724-725.

Includes graphs. (P15, Si)

334-P. (German.) **The Heating of Tensile Bars Due to Plastic Deformation.** Paul Täubert. *Zeitschrift für angewandte Physik,* v. 6, no. 3, Mar. 1954, p. 108-112.

Thermal conduction and heat transfer to surrounding areas. Influence of temperature on strength properties of a metal. Graphs. 2 ref. (P11, Q24, Q23)

335-P. (German.) **Ultra-Optical Properties of Metals and Average Free Path Length of the Conduction Electrons.** Joachim Euler. *Zeitschrift für Physik,* v. 137, no. 3, Apr. 14, 1954, p. 318-332.

Measurements on 52 layers of gold with infrared light show that relationship between conductivity and optical properties is inadequately explained. Graphs, micrographs, diagram. 23 ref. (P17, P15, Au)

336-P. (French.) **Surface Magnetic Anisotropy and Orientation Superstructures.** Louis Néel. *Journal de*

physique et le radium, v. 15, no. 4, Apr. 1954, p. 225-239.

Spontaneous magnetization and mechanical deformations of permanent magnet alloys. Graph. 19 ref. (P16, Q general, SG-n)

337-P. (Russian.) **Investigation of Field Emission of Nickel.** G. V. Spivak and A. Gel'berg. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 455-458.

Effect of hydrogen. Variation during passage through Curie point. Micrograph, graph. 11 ref. (P16, Ni)

338-P. (Russian.) **Physics of Thin Metallic and Semiconductive Layers.** I. D. Konozenko. *Uspekhi Fizicheskikh Nauk,* v. 52, no. 4, Apr. 1954, p. 561-602.

Influence of structure on electrical and physical properties. Tables, graphs, micrographs. 99 ref. (P15)

339-P. (Russian.) **Inhibiting Influence of Gaseous Reaction Products on the Velocity of Reduction of Iron Oxides by Hydrogen and Carbon Monoxide.** G. I. Chufarov, B. D. Averbukh, E. P. Tatievskaia and V. K. Antonov. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 3, Mar. 1954, p. 490-497.

Experiments show good accord with data on adsorption of reducing gases and reduction products. Graphs. 7 ref. (P12, Fe)

340-P. Electrochemical Polarization of Titanium in Aqueous Solutions of Sodium Chloride. Norman Hackerman and Colby D. Hall, Jr. *Electrochemical Society, Journal,* v. 101, June 1954, p. 321-327.

Cathodic and anodic curves for titanium in neutral sodium chloride solutions determined over range 0.02 microamp. per sq.cm. to 0.01 amp. per sq.cm. Graphs, tables. 8 ref. (P15, Ti)

341-P. Heat Transfer to Aluminum. II. Kirtland Marsh. *Industrial Heating,* v. 21, May 1954, p. 898 + 6 pages.

Emissivity factor, based on experimental conditions, is considered to show effect of radiation alone on rate of heat transfer. Photograph, tables, graphs. (To be continued.) (P11, P17, Al)

342-P. Growth Characteristics of Ingot-Mould Irons in Air and Vacuum. J. W. Grant. *Institute of British Foundrymen, Proceedings,* v. 46, 1953, p. A110-A128; disc., p. A128-A130.

Continued growth with repeated heating in vacuum was arrested by annealing at 700° C. in air. Graphs, photographs micrographs, tables. 24 ref. (P10, J23, CI)

343-P. Measurement of the Effect of Chlorine Treatment on the Work Function of Titanium and Zirconium. Herbert Malamud and Aaron D. Krumbein. *Journal of Applied Physics,* v. 25, May 1954, p. 591-592.

Photo-electric method used to find suitability of metals as counter cathode materials. Table, diagram. 4 ref. (P15, Zr, Ti)

344-P. Silicon Monoxide Reactions in Steelmaking. (Digest of "Thermodynamic Properties of Silicon Monoxide", by N. C. Tombs and A. J. E. Welch; *Journal of the Iron and Steel Institute,* v. 172, Sept. 1952, p. 69-78.) *Metal Progress.* v. 65, June 1954, p. 188 + 3 pages.

Three methods for determining amount of silicon monoxide produced from mixtures of silicon and silica, or hydrogen and silica, from 2370 to 3000° F. (P12, D general, ST)

345-P. Anomalous Electron-Scattering in Metals. D. K. C. MacDonald and W. B. Pearson. *Philosophical Magazine,* v. 45, 7th ser., no. 364, May 1954, p. 491-496.

Consequences of semitheoretical equation which accounts qualitatively for thermo-electric power of metals and alloys at low temperatures. Graphs. 9 ref. (P15)

346-P. Magnetic Viscosity in Precipitation Alloys: FeNiAl, Fe_2NiAl and Alnico. J. H. Phillips, R. Street and J. C. Woolley. *Philosophical Magazine,* v. 45, 7th ser., no. 364, May 1954, p. 505-523.

Investigations on effects of various heat treatments. Graphs. 14 ref. (P16, Fe, Ni, Al, SG-n)

347-P. The Magnetic Susceptibility of the Transition Elements. C. J. Kriessman and Herbert B. Callen. *Physical Review,* v. 94, ser. 2, May 15, 1954, p. 837-844.

Empirical data on temperature coefficient of susceptibility, absolute magnitude of susceptibility and specific heats analyzed to suggest probable alterations in available theoretical density-of-states curves. Graphs, tables. 24 ref. (P16)

348-P. Electrical Properties of Single Crystals and Thin Films of PbSe and PbTe. S. J. Silverman and H. Levinstein. *Physical Review,* v. 94, ser. 2, May 15, 1954, p. 871-876.

Measurements involve Hall constant and resistivity from which mobility, number and kind of carriers are determined. Graphs, tables. diagrams. 12 ref. (P15, Pb, Se, Te)

349-P. Properties of Plutonium Metal. Cyril Stanley Smith. *Physical Review,* v. 94, ser. 2, May 15, 1954, p. 1068-1069.

Structure and physical properties as declassified by AEC. Table, graphs. (P general, M27, Pu)

350-P. (English.) **The Ferromagnetic Anisotropy of the Specific Resistance of Some Nickel Alloys.** H. C. Van Elst and C. J. Gorter. *Applied Scientific Research,* v. 4, sec. B, nos. 1-2, 1954, p. 87-90.

Results of work on 24 nickel alloys at temperatures of 14, 20, 64, 77 and 273° K. Table. 2 ref. (P16, Ni)

351-P. (English.) **The Effect of Cold-Work on the Electrical Resistivity of Alloys and the Law of Recovery.** J. O. Linde. *Applied Scientific Research,* v. 4. sec. B, nos. 1-2, 1954, p. 73-86.

Change in resistivity due to cold work for a number of binary alloy series having copper, silver or gold as basic metal. Tables, graphs. 17 ref. (P15, Q24, Cu, Au, Ag)

352-P. (Dutch.) **Copper and Copper Alloys. XIII. Brass.** W. G. R. De Jager. *Metalen,* v. 9, no. 7, Apr. 15, 1954, p. 112-115.

Physical, electrical and thermal properties of alloys containing up to 40% zinc. Tables, graphs. (To be continued.)
(P general, Q general, Cu, Zn)

353-P. (French.) **The Theory of Magnetic Properties of Solid Substances.** Louis Néel. *Applied Scientific Research,* v. 4, sec. B, nos. 1-2, 1954, p. 13-24.

Improvements in theory of magnetic hysteresis of fine grains. Table, graph. 9 ref. (P16)

354-P. (German.) **Magnetic Behavior and Filling of Bands in the Aluminum-Manganese and the Silver-Lead Series.** E. Vogt. *Applied Scientific Research,* v. 4, sec. B, nos. 1-2, 1954, p. 34-42.

Determination of passing of electrons from transitional elements into the band. Table, graphs. 20 ref. (P16, Al, Mn, Ag, Pb)

355-P. (Book.) **Electrochemical Constants.** N.B.S. Circular 524. Proceedings of the National Bureau of Standards Semicentennial Symposium on Electrochemical Constants, Sept. 1951. 310 p. 1953. National Bureau of Standards, Washington, D. C. $2.00.

Contains 30 papers by 42 authorities. Experimental and theoretical developments in field of fundamental electrochemistry from leading establishments in U. S. and abroad. (P15)

356-P. Modern Ideas About Properties of Metals. W. E. Boas. *Australasian Engineer,* 1954, Apr., p. 57-61.

Theory of electrical resistivity and plastic deformation. Graph, diagrams. 5 ref. (P15, Q24)

357-P. The Lattice Component of the Thermal Conductivity of Metals and Alloys. P. G. Klemens. *Australian Journal of Physics,* v. 7, Mar. 1954, p. 57-63.

Magnitude of lattice conductivity is related to electronic thermal conductivity at low temperatures. Graphs, table. 16 ref. (P11)

358-P. The Thermal Conductivity of Pure Metals at Low Temperatures According to the Free Electron Theory. P. G. Klemens. *Australian Journal of Physics,* v. 7, Mar. 1954, p. 64-69.

Validity of variational method of solving integral equation for distribution of free electrons interacting with lattice vibrations. Graphs. 12 ref. (P11)

359-P. The Electrical and Thermal Conductivities of Monovalent Metals. P. G. Klemens. *Australian Journal of Physics,* v. 7, Mar. 1954, p. 70-76.

Experimentally determined values of the high and low-temperature conductivities of pure sodium, copper, silver and gold do not agree with values expected from Block free electron theory. Table. 19 ref.
(P15, P11, Au, Ag, Cu, Na)

360-P. Deviations From Matthiessen's Rule for Cold-Drawn Wires. G. J. Ogilvie and W. K. Clothier. *Australian Journal of Physics,* v. 7, Mar. 1954, p. 210-216.

High accuracy a.c. bridge method developed to measure deviations shown to exist in cold drawn wires of copper, aluminum, bronze and 80-20 brass. Diagram, table. 5 ref. (P15, F28, Cu, Al)

361-P. Curie Point Transitions in Phosphides and Arsenides of Manganese. Keith H. Sweeny and Allen B. Scott. *Journal of Chemical Physics,* v. 22, May 1954, p. 917-921.

Relative permeability of several alloys of manganese with phosphorus and arsenic measured in the region of the Curie point. Graphs, table. 20 ref. (P16, Mn, As)

362-P. Electric Conductivity of Metals at High Current Density. Ye. S. Borovik. *National Science Foundation Translation, no.* 140, Dec. 1953, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 771-774.)

Previously abstracted from original. See item 39-P, 1954.
(P15, Cu, W, Pt)

363-P. Study of Phase Transformations by Internal Friction Method. K. M. Rozin and B. N. Finkelshtein. *National Science Foundation Translation, no.* 143, Dec. 1953, 3 p. (From

Doklady Akademii Nauk SSSR, v. 91, 1953, p. 811-812.)

Previously abstracted from original. See item 43-P, 1954, (P15, Q22)

364-P. Melting Temperatures of Tin and Lead at Pressures Reaching 34,000 kg/cm². V. P. Butuzov and M. G. Gonikberg. *National Science Foundation Translation, no.* 144, Dec. 1953, 2 p. (From *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 1083-1084.)

Previously abstracted from original. See item 45-P, 1954. (P12, Pb, Sn)

365-P. Compressive Properties of Uranium. Nicholas Grossman and Seymour Priceman. *Nucleonics,* v. 12, June 1954, p. 68-69.

Poisson's ratio, shear and bulk moduli, modulus of resilience, proportional limit and yield strength. Graphs. 5 ref. (P10, Q27, Q28, U)

366-P. The Optical Constants of Silver, Gold, Copper, and Aluminum. I. The Absorption Coefficient *k*. L. G. Schulz. **II. The Index of Refraction *n*.** L. G. Schulz and F. R. Tangherlini. *Optical Society of America, Journal,* v. 44, May 1954, p. 357-368.

A comparison method for determining values of absorption coefficient *k* of a metal relative to previously determined values for silver. Reflectivities measured at an angle of incidence of 45°, in the wavelength range of 0.40 to 0.95 micron at glass-metal and air-metal interfaces. Graphs, tables, diagrams. 37 ref. (P17, Al, Ag, Au, Cu)

367-P. The Surface Energy of Colloidal Metals in Ionic Lattices. Allen B. Scott. *Philosophical Magazine,* v. 45, 7th ser., no. 365, June 1954, p. 610-620.

Energy of interface between small particles of alkali metal and an alkali halide lattice. Table, graphs. 16 ref. (P10, K, Na)

368-P. The Magnetic Properties of Alloys of Cobalt and Nickel With Palladium and Platinum. E. P. Wohlfarth. *Philosophical Magazine,* v. 45, 7th ser., no. 365, June 1954, p. 647-649.

Explanation of variation of Curie temperature with composition. Graph. 8 ref. (P16, Pd, Pt, Ni, Co)

369-P. Pressure Dependence of the Resistivity of Germanium. William Paul and Harvey Brooks. *Physical Review,* v. 94, ser. 2, June 1, 1954, p. 1128-1133.

Effect of hydrostatic pressure on sample of 35 ohm-cm. germanium investigated up to 30,000 kg. per sq. cm. at temperatures between 25 and 76° C., and up to 7000 kg. per sq. cm. at temperatures down to −195° C. Graphs. 12 ref. (P15, Ge)

370-P. Some Magnetic Properties of Dy Metal. J. F. Elliott, S. Legvold and F. H. Spedding. *Physical Review,* v. 94, ser. 2, June 1, 1954, p. 1143-1145.

Moment of dysprosium measured in fields of 4000 to 18,000 oersteds, over temperature range of 4.2 to 202° K. Graphs. 8 ref. (P16, Dy)

371-P. Superconductivity of Pure Metallic Rhenium. John K. Hulm. *Physical Review,* v. 94, ser. 2, June 1, 1954, p. 1390-1391.

Electrical resistance and magnetic induction measurements indicated that rod became superconducting at 1.699° K. 7 ref. (P15, Re)

372-P. Measurement of the Surface Properties of Germanium. J. B. Gunn. *Physical Society, Proceedings,* v. 67, no. 413B, May 1954, p. 409-421.

New technique of measurement does not support existing theories of rectification at a point contact. Two new types of transistors. Graphs. 14 ref. (P15, Ge)

373-P. Constrictions and Jogs in Extended Dislocations. A. N. Stroh. *Physical Society, Proceedings,* v. 67, no. 413B, May 1954, p. 427-436.

Probability of their being formed will depend on energy involved. Energy calculated. Diagrams. 11 ref. (P12, M26)

374-P. Physical Properties of Some Interstitial Phases. G. V. Samsonov. *Henry Brutcher, Altadena, Calif., Translation no.* 3237, 11 p. (From *Doklady Akademii Nauk SSSR,* v. 93, no. 4, 1953, p. 689-692.)

Properties of titanium, vanadium, zirconium, columbium, molybdenum, tantalum, tungsten and their borides, carbides and nitrides. 14 ref. (P general, M26, Ti, V, Zr, Cb, Mo, Ta, W)

375-P. Structure-Sensitive Properties. John H. Hollomon. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 1-15.

Electrical, mechanical and magnetic properties as a function of crystal structure. Micrographs, diagrams. 11 ref. (P15, P16, Q general, M26)

376-P. Relation of Magnetic Properties to Microstructure. L. J. Dijkstra. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 209-232.

Basic ferromagnetic concepts, coercive force of particles of subcritical size and the contribution to co-

ercive force by finely dispersed precipitates. Micrograph, diagrams, graphs. 11 ref. (P16, M27, SG-n)

377-P. Structure and Coercivity. J. F. Libsch and G. P. Conard. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 233-259.

Effects of porosity, inclusions, composition and orientation on coercivity. Graphs, micrograph. 65 ref. (P16, M27, SG-n)

378-P. (English.) **Ultrasonic Attenuation in Polycrystalline Steel.** Akira Hikata. *Government Mechanical Laboratory, Japan, Bulletin,* 1954, no. 1, 7 p.

Effect of magnetization and stress on attenuation. Table, graphs, diagrams. 12 ref. (P10, P16)

379-P. (English.) **Thermodynamical Theory of Galvanomagnetic and Thermomagnetic Phenomena. II. Reciprocal Relations for Moving Anisotropic Mixtures.** R. Fieschi, S. R. De Groot, P. Mazur and J. Vlieger. **III. Explicit Expressions for the Measurable Effects in Isotropic Metals.** R. Fieschi, S. R. DeGroot and P. Mazur. *Physica,* v. 20, no. 5, May 1954, p. 245-273.

Extension of Onsager's theory applied to heat conduction, diffusion, cross-effects and viscosity in anisotropic mixtures of charged components in an electro-magnetic field. Tables, diagrams. 19 ref. (P12, P16)

380-P. (English.) **The Anomalous Skin Effect and the Reflectivity of Metals.** C. W. Benthem and R. Kronig. *Physica,* v. 20, no. 5, May 1954, p. 293-300.

Energy dissipation appears to furnish a contribution to the absorption factor of metallic conductors which can become predominant at sufficiently low temperatures. Table. 15 ref. (P17, P11)

381-P. (French.) **Attempt to Explain the Mechanism of Conductivity of Thin Granulated Metal Plates.** Nicolas Nifontoff. *Comptes rendus,* v. 238, no. 19, May 10, 1954, p. 1870-1872.

Possible interpretation of electric properties based on semiconductor features of a more or less continuous cover which can exist between the grains. Diagram, graphs. 11 ref. (P15, Ge)

382-P. (French.) **Determination of Ionization Current of Copper in Electrolysis by the Method of Radioactive Tracers.** René Audubert. *Comptes rendus,* v. 238, no. 20, May 17, 1954, p. 1997-1999.

Calculation of beta transfer coefficient of the reciprocal process in an electrolyte. Graph. 7 ref. (P15, Cu)

383-P. (German.) **The Electric Field in the Passive Layer of Iron.** Klaus J. Vetter. *Zeitschrift für Elektrochemie,* v. 58, no. 4, 1954, p. 230-237.

Relationship of passive layer thickness to anodal current density and potential, temperature relationship of corrosion and conductivity. Graphs. 45 ref. (P15, R1, Fe)

384-P. (Russian.) **Determination of Calcium and Strontium Vapor Pressure at Temperatures Below Melting Points by the Method of Tagged Atoms.** Iu. A. Priselkov and An. N. Nesmeianov. *Doklady Akademii Nauk SSSR,* v. 95, no. 6, Apr. 21, 1954, p. 1207-1210.

Investigation at 475 to 670° C. for calcium and 400 to 600° C. for strontium. Diagrams, graph, table. 6 ref. (P12, Ca, Sr)

385-P. (Russian.) **Change of Linear Dimensions of Steel Samples in Dependence of Heat Treatment Conditions.** I. E. Brainin and A. V. Tursunov. *Vestnik Mashinostroeniia,* v. 34, no. 4, Apr. 1954, p. 65-67.

Results of investigation on steel and steel alloys. Tables, chart. 8 ref. (P10, ST)

386-P. (Russian.) **The Thermodynamic Properties of Binary Metallic Systems by Electromotive Force Method: Cadmium-Bismuth System.** A. V. Nikol'skaia and Ia. I. Gerasimov. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 4, Apr. 1954, p. 713-728.

Coefficients of activity in the 400° to 650° C. range. Heats of formation of alloys from liquid compounds. Tables, graphs. 18 ref. (P12, Cd, Bi)

387-P. Permanent Magnets. *Edgar Allen News,* v. 33, June 1954, p. 121-123.

Magnetic and general physical properties and characteristics of numerous materials. Photographs, table, graph. (To be continued.) (P16, SG-n)

388-P. Heat Capacity of Laminations. L. G. A. Sims and K. L. Morphew. *Engineering,* v. 177, June 18, 1954, p. 781-782.

Experimental and theoretical values for silicon-steel stampings used for transformer cores. (P12, AY)

389-P. The Automatic Measurement of Specific Heat. T. Hirone, S. Maeda, I. Tsubokawa and N. Tsuya. *Engineers' Digest,* v. 15, June 1954, p. 239-240. (From *The Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 5, no. 6, Dec. 1953, p. 513-519.)

Method for thermal analysis of various ferromagnetic compounds and binary superlattice alloys. Diagrams, graph. 3 ref. (P12)

390-P. Heat Transfer to Aluminum. III. Kirtland Marsh. *Industrial Heating,* v. 21, June 1954, p. 1120 + 6 pages.

Effect of various emissivities on heating rate illustrated by series of calculated time-temperature curves. Table, graphs. (To be continued.) (P11, Al)

391-P. Solar Thermoelectric Generators. Maria Telkes. *Journal of Applied Physics,* v. 25, June 1954, p. 765-777.

Thermo-electric power, resistivity, specific heat conductivity and temperature difference between hot and cold junctions determine efficiency of thermocouple materials. Values for Chromel P-constantan, bismuth alloys and ZnSb. Tables, graphs, photographs, diagrams. 60 ref. (P15, S16, Cr, Bi, Sb, Fe, Cu)

392-P. Frequency Spectrum and Specific Heat of a Face-Centered Cubic Lattice. I. II. Low Temperature Region. Carl W. Garland and George Jura. *Journal of Chemical Physics,* v. 22, June 1954, p. 1108-1117.

Born-von Karman treatment for a face-centered cubic lattice using techniques developed by Montroll. Numerical data for silver. Diagram, tables, graphs. 14 ref. (P12, M26, Ag)

393-P. Shorting and Field Corrections in Hall Measurements. W. F. Flanagan, P. A. Flinn and B. L. Averbach. *Review of Scientific Instruments,* v. 25, June 1954, p. 593-595.

Method for correcting measured Hall voltage for shorting by current contacts and for inhomogeneities in applied magnetic field. Method applied to measurements of Hall coefficient in gold-silver alloys. Diagram, graphs. 4 ref. (P15, Ag, Au)

394-P. Properties of the Superconducting Modification of Bismuth. N. V. Zavaritsky. *National Science Foundation Translation, no.* 172, Jan. 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 787-790.)

Previously abstracted from original. See item 41-P, 1954. (P15, Bi)

395-P. Effect of Temperature on Light Absorption in Thin and Extra-Thin Layers of Silver. A. G. Gumenyuk. *National Science Foundation Translation, no.* 171, Jan. 1954, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 783-786.)

Previously abstracted from original. See item 40-P, 1954. (P17, Ag)

396-P. (English.) **The Effect of Hydrogen on Ultrasonic Attenuation and Velocity Measurements in Titanium.** C. F. Ying and R. Truell. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 374-379.

Values changed by large amounts when metal was heated in hydrogen at temperatures near 550° C. Attenuation decreased with increasing hydrogen content. Table, graphs, micrographs. 8 ref. (P10, Ti)

397-P. (English.) **Effect of Cold Work on the Magnetic Susceptibility of Copper and Aluminum.** J. D. McClelland. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 406-408.

Susceptibilities measured as function of cold work. Graph, table. 8 ref. (P16, Cu, Al)

398-P. (English.) **Studies in Magnetochemistry. X. The Non-Radical Nature of the Barium Salts of Alloxantin, Tetramethyl-Alloxantin and Hydrindantin. XI. The Magnetic Properties of the Elements Niobium, Tantalum and Rhenium.** R. W. Asmussen and H. Soling. *Acta Chemica Scandinavica,* v. 8, no. 4, 1954, p. 558-568.

Magnetic susceptibilities were measured at 79 to 578° K. Graphs, tables. 15 ref. (P16, Cb, Ta, Re)

399-P. (English.) **On the Existence of a Metallic Molybdenum Oxide.** Nils Schönberg. *Acta Chemica Scandinavica,* v. 8, no. 4, 1954, p. 617-619.

Molybdenum oxide with the probable ideal formula Mo_3O prepared by reaction between molybdenum powder and MoO_2 at a comparatively low temperature. Table. 4 ref. (P13, Mo)

400-P. (English.) **Solubility of Nitrogen in Alpha-Iron.** Hans U. Åström and G. Borelius. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 547-549.

Measurements in range of 570 to 170° C. by mechanical relaxation phenomenon and isothermal calorimetry. Graphs. 2 ref. (P13, Fe)

401-P. (English.) **Radiation Ordering in Cu_3Au.** T. H. Blewitt and R. R. Coltman. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 549-551.

Investigations show evidence of continuous spectrum rather than single activation energy associated with radiation energy. Graphs. 4 ref. (P13, Cu, Au)

402-P. (German.) **State of Technical Development of Ferromagnetic Materials.** Hermann Reinboth. *Nachrichten-technik,* v. 4, no. 4, Apr. 1954, p. 182-186.

Progress in technology, applications and production. Graphs, charts. (P16, Fe, Ni, Al)

403-P. (German.) **Energy Spectra of 35 kv.-Electrons Reflected From Surfaces of Solids.** W. Kleinn. *Optik,* v. 11, no. 5, 1954, p. 226-243.

Experimental equipment, method and materials. Discreet energy losses and ratio of elastic to nonelastic scatter. Diagrams, photographs, tables, spectrograms. 24 ref. (P15)

404-P. (German.) **The Surface Energy of Solid Materials.** Rudolf Auerbach. *Werkstoffe und Korrosion,* v. 5, no. 6, June 1954, p. 208-212.

Relationship between tensile strength and other mechanical values, importance of capillary pressure in active fillers and in precipitation hardening, place of synthetic materials in "Parachor Diagram", surface tension of metals in solid state. Diagrams, graphs, tables. 14 ref. (P10, Q23)

405-P. (German.) **Results of Low Temperature Research. XII. Heat of Fusion of Cesium.** Klaus Clusius and Harald Stern. *Zeitschrift für angewandte Physik,* v. 6, no. 5, May 1954, p. 194-196.

Experiments compared with published data. Tables, diagram. 13 ref. (P12, Cs)

406-P. (German.) **Cold Electron-Emission of Metallic Surfaces (Exoelectrons).** Karl Lintner and Erich Schmid. *Zeitschrift für Metallkunde,* v. 45, no. 5, May 1954, p. 276-285.

Experimental arrangement and theoretical interpretation. Diagrams, graphs, table. 46 ref. (P15)

407-P. (German.) **ThB and ThC as Radio-Indicators in Physical Chemistry of Metals.** Wolfgang Seith and Ulrich Gonser. *Zeitschrift für Metallkunde,* v. 45, no. 5, May 1954, p. 293-297.

Structure of molten aggregate state, thermodynamic activity and vapor pressure at 913° K. in system lead - bismuth. Diagrams, graphs. 16 ref. (P13, M26, Pb, Bi)

408-P. (Polish.) **Soft Magnetic Materials.** M. Markuszewicz. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 1, 1954, p. 1-12.

Effects of metallurgical and structural factors. Manufacture of pure iron and iron alloyed with silicon, aluminum, nickel and cobalt. Tables, graphs, diagrams. 95 ref. (P16, Fe, SG-p)

409-P. (Polish.) **Materials for Permanent Magnets.** L. Kozlowski. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 1, 1954, p. 13-19.

Structural and magnetic stability of martensitic steel and cast alloys of the Alni and Alnico type. Graphs, tables. 40 ref. (P16, SG-n)

410-P. (Polish.) **Measurement Methods of Magnetic Properties of Materials for Permanent Magnets.** L. Kozlowski and J. Siewierski. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 1, 1954, p. 44-49.

Instruments and techniques. Graphs, photographs, diagrams. 7 ref. (P16, SG-n)

411-P. (Russian.) **Thermodynamic Properties of Sulfur in Liquid Iron-Sulfur Alloys Saturated With Carbon.** N. A. Vatolin and O. A. Esin. *Zhurnal Obshchei Khimii,* v. 24, no. 5, May 1954, p. 795-798.

Electromotive force, activities and coefficient of activity of sulfur. Graphs, tables. 9 ref. (P12, Fe)

412-P. **Mechanism of the Reaction of Hydrogen With Zirconium I. Role of Oxide Films, Pretreatments, and Occluded Gases.** E. A. Gulbransen and K. F. Andrew. *Electrochemical Society, Journal,* v. 101, July 1954, p. 348-353.

Rate of reaction of high-purity zirconium with pure hydrogen using a sensitive microbalance method, and an all-glass and ceramic vacuum system to minimize contamination. Table, graphs. 10 ref. (P13, Zr)

413-P. **Electrical Properties of Semiconducting AlSb.** R. K. Willardson, A. C. Beer and A. E. Middleton. *Electrochemical Society, Journal,* v. 101, July 1954, p. 354-358.

Electrical resistivity, thermo-electric power and Hall voltage as function of temperature from 80 to 1200° K. Graphs, diagram. 17 ref. (P15, Al, Sb)

414-P. **Conductivity and Hall Effect in the Intrinsic Range of Germanium.** F. J. Morin and J. P. Maita. *Physical Review,* v. 94, ser. 2, June 15, 1954, p. 1525-1529.

Measurements at 250 to 1000° K. Graphs. 9 ref. (P15, Ge)

415-P. **Photoconductivity in Gold-Doped Silicon.** R. Newman. *Physical Review,* v. 94, ser. 2, June 15, 1954, p. 1530-1531.

Measurements at 20, 77 and 195° K. Graph. 3 ref. (P15, Si)

416-P. **Stored Energy Measurements in Irradiated Copper.** Albert W. Overhauser. *Physical Review,* v. 94, ser. 2, June 15, 1954, p. 1551-1557.

Thin copper foils, cooled to liquid nitrogen temperature, were subjected to bombardment by 12-m.e.v. deuterons. Stored energy released due to annealing of radiation damage was measured as foils warmed

to room temperature. Diagram, graphs. 11 ref. (P10, Cu)

417-P. Photon-Radiative Recombination of Electrons and Holes in Germanium. W. van Roosbroeck and W. Shockley. *Physical Review,* v. 94, ser. 2, June 15, 1954, p. 1558-1560.

Spectral distribution of rate of photon generation for the photon-radiative recombination determined from known optical properties by principle of detailed balance. Graphs. 13 ref. (P17, Ge)

418-P. Photomagnetoelectric Effect in Germanium and Silicon. Hubert Bulliard. *Physical Review,* v. 94, ser. 2, June 15, 1954, p. 1564-1566.

Photomagneto - electric voltage reached steady-state value by passing through a maximum instead of reaching it by progressive increase. Diagrams, graphs. 7 ref. (P15, P17, Ge, Si)

419-P. Photoconductivity and Photoelectromagnetic Effects in InSb. S. W. Kurnick, A. J. Strauss and R. N. Zitter. *Physical Review,* v. 94, ser. 2, June 15, 1954, p. 1791.

Responses observed at 300 and 77° K. in *p*-type samples of InSb which are intrinsic at room temperature. Graphs. 6 ref. (P15, P17, In, Sb)

420-P. Recombination of Holes and Electrons at Lineage Boundaries in Germanium. F. L. Vogel, W. T. Read and L. C. Lovell. *Physical Review,* v. 94, ser. 2, June 15, 1954, p. 1791-1792.

Excess holes and electrons recombine at a small-angle grain boundary made up of edge dislocations. The boundary has a characteristic recombination velocity. Diagram, table, graphs. 4 ref. (P15, Ge)

421-P. Hyperfine Structure of In^{115}. Evidence of a Nuclear Octupole. Moment. P. Kusch and T. G. Eck. *Physical Review,* v. 94, ser. 2, June 1954, p. 1799.

Hyperfine structure intervals measured with high precision in search for effects arising from a nuclear magnetic octupole moment. 3 ref. (P16, In)

422-P. Calculations of the First Ferromagnetic Anistropy Coefficient, Gyromagnetic Ratio and Spectroscopic Splitting Factor for Nickel. G. C. Fletcher. *Phsyical Society, Proceedings,* v. 67, no. 414A, June 1954, p. 505-519.

Calculations based on collective electron theory of the corresponding effects due to Brooks and the calculations of the author of the N(E) curve for the 3d electrons. 18 ref. (P16, Ni)

423-P. (Dutch.) **Permanent Magnets.** H. M. Dito. *Bedrijf en Techniek,* v. 9, no. 204; *Electronica section,* v. 7e, no. 151, June 19, 1954, p. 101.

Remanence, coercive force and field strength of ferroxydure. Graph. (P16, SG-p)

424-P. (French.) **Electric Conductivity of Solid and Molten Copper-Tin Alloys.** Genevieve Darmois. *Comptes rendus,* v. 238, no. 23, June 9, 1954, p. 2230-2232.

Experimental results at 0° C. Temprature coefficient of resistivity. Tables, graph. (P15, Cu, Sn)

425-P. (French.) **Experimental Determination of Activities of Copper and Gold in Their Alloys.** Daniel Balesdent and Maurice Dode. *Comptes rendus,* v. 238, no. 23, June 9, 1954, p. 2236-2238.

Reduction equilibrium of cuprous sulfide by hydrogen in presence of gold. 6 ref. (P12, Cu, Au)

426-P. (German.) **An Irreversible Change in the Remanence of Plastically Elongated Nickel.** L. Reimer. *Zeitschrift für Physik,* v. 137, no. 5, June 1954, p. 588-594.

Measurement of thermal relaxation by cooling to liquid-air temperature confirms theory that change is due to second-type internal stresses. Graphs. 11 ref. (P16, Q25, Ni)

427-P. (Russian.) **Distribution of Sulfur and Phosphorus Between Iron and Acid Slag.** I. A. Tomilin and L. A. Shvartsman. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 12, Dec., p. 1797-1803.

Effects of temperature on equilibrium compositions. Tables, graphs. 7 ref. (P12, Fe)

428-P. (Russian.) **Peculiarities of Change of Physico-Chemical Properties of Copper Selenide.** M. I. Kochnev and T. I. Zaidman. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 12, Dec., p. 1813-1818.

Thermal dissociation, specific heat and phase transformations in range 450 to 1100° C. Tables, graphs. 14 ref. (P11, P12, N6, Cu, Se)

429-P. (Russian.) **Relation of Surface Tension of Cr-Ni Melts With Certain Properties of Chromium-Nickel Alloys.** O. S. Bobkova and A. M. Samarin. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 2, Feb., p. 52-59.

Method used in determining surface tension, influence of metallic and nonmetallic inclusions, relation between surface tension and mechanical properties and flowability. Tables, graphs, diagrams. 2 ref. (P10, Q general, Cr, Ni)

430-P. (Russian.) **Linear Shrinkage of Steel Castings.** P. P. Berg and V. N. Saveiko. *Liteinoe Proizvodstvo,* 1954, no. 3, May-June, p. 24-26.

Free and impeded shrinkage formulas and shrinkage impedence force. Graphs. 2 ref. (P10, CI)

431-P. (Russian.) **Heat Treatment of Constantan for High-Temperature Strain Gages.** N. G. Tisenko and Iu. M. Margolin. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 71-74.

Conditions to obtain constant electrical resistance at temperatures up to 400° C. Graphs, tables. 3 ref. (P15, J general, Q25, Cu, Ni)

432-P. (Book.) **Physical Properties of Solid Materials.** C. Zwikker. 300 p. 1954. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. $8.75.

Constitution; elasticity; plasticity; transformations; porosity; ferromagnetism and ferro-electricity; electronic and surface properties. (P general, M general, N general, (Q21, Q23)

433-P. (Book.) **Proceedings of the General Discussion on Heat Transfer.** 496 p. 1951. Institution of Mechanical Engineers, London; American Society of Mechanical Engineers, 29 West 39th St., N. Y. $10.00.

See item 126-P, 1952. (P11)

434-P. (Book.) **The Properties of Tin.** 55 p. 1954. Tin Research Institute, Fraser Road, Greenford, Middlesex, England. Free.

Atomic, crystallographic, optical, electrical, magnetic, thermal, and mechanical properties. (P general, Q general, M general, Sn)

435-P. An Electrochemical and Structural Investigation of the Processes Occurring at Silver Anodes in Sulphuric Acid. P. Jones and H. R. Thirsk. *Faraday Society, Transactions,* v. 50, July 1954, p. 732-739 + 1 plate.

Behavior of silver on anodic polarization in 2*N* sulfuric acid was found to resemble closely that of lead in the same electrolyte. Graphs, micrographs, table. 10 ref. (P15, Ag)

436-P. The Melting Point of Titanium. T. H. Schofield and A. E. Bacon. *Industrial Heating,* v. 21, July 1954, p. 1348, 1400.

Condensation of a paper presented before the British Institute of Metals. Apparatus and experimental procedure. Indicated melting point was 3020 ± 18° F. (P12, Ti)

437-P. Contact Charging Between Nonconductors and Metal. John W. Peterson. *Journal of Applied Physics,* v. 25, July 1954, p. 907-915.

Charging of fused quartz and borosilicate glass spheres rolling on a clean nickel surface. Diagrams, graphs. 4 ref. (P15, Ni)

438-P. Thermomagnetic Properties of Thin Metallic Films. F. J. Blatt. *Physical Review,* v. 95, ser. 2, July 1, 1954, p. 13-15.

Calculation of Sondheimer on the galvanomagnetic effects in thin metallic films is extended so as to permit the evaluation of the Nernst, Ettinghausen, and Leduc-Righi coefficients. 6 ref. (P16)

439-P. Theory of the Galvanomagnetic Effects in Germanium. B. Abeles and S. Meiboom. *Physical Review,* v. 95, ser. 2, July 1, 1954, p. 31-37.

Attempts to explain observed magnetoresistance effects by assuming a simple anisotropic model, in which the energy surfaces in momentum space have a number of extrema. Tables, graphs. 12 ref. (P15, M26, Ge)

440-P. Some Properties of *p*-Type Gallium Antimonide Between 15° K and 925° K. H. N. Leifer and W. C. Dunlap, Jr. *Physical Review,* v. 95, ser. 2, July 1, 1954, p. 51-56.

Temperature variation of some of the conduction properties of single crystals. Graphs. 16 ref. (P15, Ga, Sb)

441-P. Theory of Secondary Electron Cascade in Metals. P. A. Wolff. *Physical Review,* v. 95, ser. 2, July 1, 1954, p. 56-66.

Diffusion, energy loss, and multiplication of secondary electrons within a metal. Table, graphs. 13 ref. (P10, Al, Cu, Li, Ag)

442-P. (French.) **The Study of Magnetostriction Phenomena.** Roger Vautier. *Annales de physique,* v. 9, 12th Series, May-June 1954, p. 322-372.

Results of investigation of iron and nickel monocrystals, cobalt ferrites, and mixed ferrite of manganese and zinc. Tables, graphs, diagrams. 25 ref. (P16, Fe, Ni, Co, Mg, Zn)

443-P. (French.) **Complex Initial Magnetic Permeability of Iron From 0 to 7000 Mc.** Jean Benoit and Ernst

Naschke. *Comptes rendus,* v. 238, no. 24, June 14, 1954, p. 2292-2294.

With large domains the magnetic dispersion attributable to dynamics of boundaries takes place at rather low frequencies. Graphs. 2 ref. (P16, Fe)

444-P. (French.) **Anisotropy in the Effect of Elastic Deformations on the Superconductivity of Tin.** Claude Grenier. *Comptes rendus,* v. 238 no. 24, June 14, 1954, p. 2300-2303.

Effect of elastic compression and tension. Graph, table. 5 ref. (P15, Sn)

445-P. (German.) **Errors of Measuring Magnetic Reversal Losses of Electric Sheets on Epstein and Ring Test Specimens.** Robert Ochsenfeld. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 293-297; disc., p. 297-298.

Nonuniform magnetization of specimens makes testing and comparison difficult. Diagrams, graphs, tables, photographs. 13 ref. (P15, P16, ST)

446-P. (German.) **Influencing Conductivity of Highly Pure Copper by Admixtures.** O. Kayser, F. Pawlek, and K. Reichel. *Metall,* v. 8, nos. 13-14, July 1954, p. 532-537.

Effect of soluble and insoluble impurities, compressive stresses, sintering conditions, and recovery on conductivity. Graphs, diagrams, tables. 66 ref. (P15, Cu)

447-P. (Russian.) **Latent Deformation Energy of Metals at Low Temperature.** V. I. Khotkevich, E. F. Chaikovskii, and V. V. Zashkvara. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 483-486.

Method and results of investigations of cadmium and tin at liquid nitrogen temperature and copper at room temperature. Graphs. 12 ref. (P12, Cd, Sn, Cu)

448-P. (Russian.) **Nonequilibrium Character of Energy Distribution in an Electric Discharge and Chemical Reactions.** K. N. Mochalov. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 553-556.

Temperature measurements of various discharge regions of copper electrodes by spectroscopic methods. 15 ref. (P13, P15, Cu)

449-P. (Russian.) **Paramagnetic Relaxation in Metals.** S. V. Vonsovskii and S. G. Salikhov. *Doklady Akademii Nauk SSSR,* v. 96, no. 4, June 1, 1954, p. 717-719.

Paramagnetic absorption of energy of a high-frequency field. Two periods of relaxation. Graphs. 6 ref. (P16, Cr, W, Ru, Rh)

450-P. (Russian.) **Magnetic Dispersion of Sound for Longitudinal Vibrations.** L. L. Miasnikov and G. K. Ul'ianov. *Doklady Akademii Nauk SSSR,* v. 96, no. 4, June 1, 1954, p. 729-731.

Effect of magnitude of magnetic induction sheet thickness, and distribution of eddy currents. Graphs. 2 ref. (P10, Al)

451-P. (Russian.) **Some Metallurgical Equilibria With Participation of Acid Slags.** V. A. Kozheurov and D. M. Laptev. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 5, May 1954, p. 814-823.

Distribution of oxygen between metals and acid slags. Solubility of silica. Equation for free energy of five-component slag. Tables, graphs. 9 ref. (P12, B21, Fe)

452-P. (Russian.) **Error in Fusion Viscosity Measurement Due to Thermal Expansion of Platinum Spheres of Torsion Viscosimeters.** V. T. Slavianskii and N. G. Gutkina. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 5, May 1954, p. 851-855.

Correction formulas. Graphs, table, diagrams. 4 ref. (P10, P11, Pt)

453-P. Threshold Field Properties of Some Superconductors. E. Maxwell and O. S. Lutes. *Physical Review,* v. 95, ser. 2, July 15, 1954, p. 333-338.

Some refined measurements of critical field curves for tin, thorium, indium and mercury compared with specific predictions of the Gorter-Casimir and Koppe versions of the two-fluid model of super-conductivity. Tables, graphs. 8 ref. (P15, Sn, Th, In, Hg)

454-P. Some Properties of Germanium-Silicon Alloys. Everett R. Johnson and Schuyler M. Christian. *Physical Review,* v. 95, ser. 2, July 15, 1954, p. 560-561.

Variation of physical constants with composition. Graphs, table. (P general, Ge, Si)

455-P. Magnetic Domains in Cobalt by the Longitudinal Kerr Effect. Charles A. Fowler, Jr., and Edward M. Fryer. *Physical Review,* v. 95, ser. 2, July 15, 1954, p. 564-565.

Technique for examining small domains usually encountered in ordinary ferromagnetic crystals. Photographs. 5 ref. (P16, Co)

456-P. The Mechanical Properties of Crystalline Metal Surfaces. A. J. Shaler. Paper from "Structure and Properties of Solid Surfaces". Univ. of Chicago Press, p. 120-138; disc., p. 138-146.

Various experimental measurements of surface tension and energy. Reviews nature and characteristics of concepts of surface ten-

sion and energy and of associated surface energies. Diagram, graph. 74 ref. (P10, P12)

457-P. (French.) **Effect of Condensation Surface Temperature on Values of Condensation Coefficients of Molecular Jets of Antimony and Gold.** Marcel Devienne. *Comptes rendus,* v. 238, no. 25, June 21, 1954, p. 2397-2399.

Results at various temperatures. 2 ref. (N16, Sb, Au)

458-P. (French.) **Influence of the Thickness of Weiss Domains on Permeability of Iron Between 0 and 7000 Mc.** Jean Benoit and Ernst Naschke. *Comptes rendus,* v. 238, no. 25, June 21, 1954, p. 2404-2405.

Armco iron annealed for 5 hr. in purified hydrogen at temperatures up to 1220° C. Graphs. 1 ref. (P16, Fe)

459-P. (French.) **Theory of Electrolytic Conductivity. II.** T. G. Owe Berg. *Journal de chimie physique,* v. 51, no. 4, Apr. 1954, p. 161-164.

Kinetics of reactions and process controlling rates; processes at the electrodes; molecular bonds. 7 ref. (P15)

460-P. (German.) **Entropy of Melting and Resistance Ratio at the Melting Point of Certain Multivalent Metals.** A. Knappwost. *Monatshefte für Chemie,* v. 85, no. 3, June 1954, p. 548-557.

Data from tests on zinc, lead and aluminum agree with calculations based on the electron theory of metals. Diagrams, graphs. 12 ref. (P12, Zn, Pb, Al)

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Impurities account for most effects commonly ascribed to disturbances. Graphs, diagrams, photograph. 19 ref. (P15, Ge)

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Specific conductivity and Hall constant of InSb from −220 to 470° C. Diagram, graphs. 17 ref. (P15, In, Sb)

463-P. The Electrochemical Polarization of Zirconium in Neutral Salt Solutions. Norman Hackerman and Olin B. Cecil. *Electrochemical Society, Journal,* v. 101, Aug. 1954, p. 419-425.

Cathodic and anodic polarization curves in neutral sodium chloride at constant current densities between 3.5 x 10^{-8} and 3.5 x 10^{-3} amp. per sq. cm^2. Graphs. 7 ref. (P15, R5, Zr, Hf)

464-P. Hydrogen Overvoltage on Bright Platinum. II. pH and Salt Effects in Acid, Neutral, and Alkaline Solutions. Sigmund Schuldiner. *Electrochemical Society, Journal,* v. 101, Aug. 1954, p. 426-432.

Mechanism and measurement over the pH range 0.5 to 12.1. Graphs, table, diagram. 8 ref. (P15, Pt)

465-P. An Experimental Confirmation of the Drude Free Electron Theory of the Optical Properties of Metals for Silver, Gold, and Copper in the Near Infrared. L. G. Schulz. *Optical Society of America, Journal,* v. 44, July 1954, p. 540-545.

Optical constants n and k determined from reflectivity and from transmissivity measurements in wave length range of 1 μ to 3 μ. Graphs, diagram, tables. 26 ref. (P17, Ag, Au, Cu)

466-P. (French.) **Paramagnetic and Thermal Study of the Heusler $MnSnCu_2$ Alloy.** Pierre Taglang and Georges Asch. *Comptes rendus,* v. 238, no. 26, June 28, 1954, p. 2500-2502.

Superstructure below melting point and strong discontinuity of paramagnetic properties accompanying melting. Two transformations and their relation to differences in ferromagnetism. Graphs. 3 ref. (P16, M27, Mn, Sn, Cu)

467-P. (French.) **Interpretation of Magnetic Properties of Rare Earth Ferrites.** Louis Néel. *Comptes rendus,* v. 239, no. 1, July 5, 1954, p. 8-11.

Decomposition of primary lattice into a ferromagnetic sublattice bound to a paramagnetic sublattice of rare-earth ions. Effect of temperature on paramagnetic sublattice. 9 ref. (P16, EG-g)

468-P. (French.) **Hysteresis Phenomena Presented by Rectifier Contacts and Thin Layers.** Nicolas Nifontoff. *Comptes rendus,* v. 239, no. 1, July 5, 1954, p. 31-33.

Diffusion of impurity ions in metal-semiconductor barriers under applied potential differences. Graphs. 5 ref. (P16)

469-P. (French.) **Thermomagnetic Study of Gadolinium Ferrite.** René Pauthenet and Pierre Blum. *Comptes rendus,* v. 239, no. 1, July 5, 1954, p. 33-35.

Measurement, by axial extraction method, of specific magnetism from 4 to 700° C. Graph. 7 ref. (P16, Fe, Gd)

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Data for tests up to 500° C. Graph. 3 ref. (P11, Si)

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Energies depend on ratios of atomic radii. Effects of specific surface energies on sorbent distribution. Tables, photographs, graphs. 22 ref. (P13)

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Effects of hardening temperature on mechanical and electrical properties and on amount of segregation. Graphs, table. 15 ref. (P15, Q general, J26, Cu, Cr)

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Effects of temperature on vapor and dissociation pressures of copper and its oxides. Micrograph, photograph, graph, diagrams. 21 ref. (P12, Cu)

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Theoretical effects of internal stresses confirmed by thermal recovery and reversible change in remanence by cooling nickel to the temperature of liquid air. Graphs. 11 ref. (P16, Ni)

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Increased frequency of torsional sound waves and increase of absorption. Graphs. (P16, Al, Cu, Mg)

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Activation energies and temperature ranges. Diagram, graphs, tables. 25 ref. (P13, Cu, Ag, Au)

477-P. The Catalytic Decomposition of Carbon Monoxide on Large Metallic Single Crystals. Victor J. Kehrer, Jr., and Henry Leidheiser, Jr. *Journal of Physical Chemistry,* v. 58, July 1954, p. 550-555.

Catalytic activities of cobalt, copper, nickel, silver, iron, chromium and molybdenum crystals and on palladium and rhodium-plated films. Diagram, tables. 22 ref. (P13, Co, Cu, Ni, Ag, Fe, Cr, Mo, Pd, Rh)

478-P. Comparative Electrical Properties of Some Metals. *Materials & Methods,* v. 40, Aug. 1954, p. 123.

Tabulated data for copper, brass, zinc, cast iron, steel, aluminum and magnesium. (P15, Cu, Zn, CI, ST, Al, Mg)

479-P. Energy Band Shapes and Band Widths in Metals. S. Raimes. *Philosophical Magazine,* v. 45, 7th ser., no. 366, July 1954, p. 727-734.

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Broad agreement between anisotropy in both the thermal and electrical resistance. 2 ref. (P11, P15, Ga)

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Equipment and techniques for thermal analysis. Diagrams, graphs. 4 ref. (P12)

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Theory of deoxidation practice in steelmaking. Diagrams, tables, graphs. 16 ref. (P12, D2, ST)

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New experimental results permit calculation of activation energies of oxide mixtures. Graphs. 5 ref. (P13, Fe)

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Experimental procedure of determining relative frequency of alpha-radiation of U^{235} and U^{234}. Graph, table. 6 ref. (P13, U)

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Experimental measurements. Tables, graphs. 3 ref. (P15, Ca, Si, Sn, Pb, Zn, Sb)

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Quantitative interdependence between physical properties. 6 ref. (P15, P16, SG-n)

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Values from room temperature to melting point. Graphs. 1 ref. (P11, In, Sb)

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Experimental data on aluminum, zinc, indium, thallium, lead, mercury, gallium and bismuth. Graphs, table. 29 ref. (P15, Al, Zn, In, Tl, Pb, Hg, Ga, Bi)

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Survey of available data on the rare metals. Includes mechanical properties. Tables. 11 ref. (P general, Q general, EG-b)

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Influence of retained austenite and martensite on physical properties. Micrographs, photographs, graphs. 11 ref. (P16, P general, AY)

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Increase of Debye temperature measured by electrical resistance at 4.2 to 77° K. Graphs. 9 ref. (P12, N10, Au, Cu)

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Study made at 20 to 428° K. for the visible and ultraviolet spectrum and explained by the electron theory of metals. Diagrams, graphs. 47 ref. (P17, Cu, Ag, Au)

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Vapor-pressure isotherm and thermodynamic activity of lead and bismuth. Experimental details. Diagrams, tables, graphs. 23 ref. (P12, Pb, Bi)

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Includes diagrams, tables, graphs. 20 ref. (P15, Ni)

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Development of indirect method of determining the Billiter potential of copper and bismuth electrodes where current flow is neutralized. Diagrams, tables, graphs. 7 ref. (P15, Cu, Bi)

523-P. Equilibrium Pressure Measurements Above ZnS From 680° to 825° C. C. Law McCabe. *Journal of Metals.* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 969-971.

Experimental data show vapor in equilibrium with solid zinc sulfide is predominantly Zn and S_2. Graph, table. 13 ref. (P12, N15, Zn)

524-P. Ferromagnetism of Certain Manganese-Rich Alloys. E. R. Morgan. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 983-988.

Tests on manganese-aluminum-carbon alloys following various heat treatments. Tables, micrographs, graph, X-ray pattern. 11 ref. (P16, Mn, Al)

525-P. Coefficients of Thermal Expansion for Zirconium. R. B. Russell.

Journal of Metals, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1045-1052.

X-ray back-reflection measurement of lattice parameters from 0 to 600° C. shows coefficients to be straight-line functions of temperature. Hafnium depresses the mean coefficient. Tables, photographs, graphs. 35 ref. (P11, Zr)

526-P. Viscosity and Density of Liquid Lead-Tin and Antimony-Cadmium Alloys. H. J. Fisher and A. Phillips. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1060-1070.

Logarithmic decrement method used to determine influence of temperature and composition. Activation energies for viscosity determined. Diagrams, tables, graphs. 40 ref. (P10, P13, Pb, Sn, Sb, Cd)

527-P. Correlation Between Microstructure and Resistivity of Transforming Ti-Mn Alloys. D. J. DeLazaro and D. W. Levinson. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1089-1092.

Tests at 700, 600, 500 and 400° C. on alloys containing 6 to 10 weight % manganese. Graphs, micrographs. 4 ref. (P15, M27, Ti, Mn)

528-P. (German.) **Density of Molten Metals and Alloys.** A. Schneider, A. Stauffer and G. Heymer. *Naturwissenschaften,* v. 41, no. 14, July 1954, p. 326-327.

Brief review of literature. Graph, table. 13 ref. (P10)

529-P. (German.) **Explanation of Electron Emission of Metals and Nonmetals After Machining and Irradiation.** H. Nassenstein. *Naturwissenschaften,* v. 41, no. 14, July 1954, p. 329.

Formation of densely populated electron levels by lattice disturbances. 4 ref. (P15)

530-P. (Russian.) **Method of Studying Rates of Electrochemical Reactions.** A. T. Vagramian and Z. A. Solov'eva. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 6, June 1954, p. 1153-1157 + 2 plates.

Deposition of cobalt and chromium, time in solution, changing current strength and polarization. Diagram, graphs. 6 ref. (P15, Cr, Co, Zn)

531-P. (Russian.) **Influence of Surface Levels on Electrical Properties of Fine-Grained Films of Germanium, Silicon, and Tellurium.** Ia. E. Pokrovskii. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1229-1243.

Relation of Hall effect, grain size and resistance of semi-conductor films produced in vacuum over wide range of temperature. Graphs, tables. 22 ref. (P15, Ge, Te, Si)

532-P. (Russian.) **Influence of Foreign Ions on Potential of Copper Separation (Deposition).** V. V. Mikhailov. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 6, June 1954, p. 1067-1075.

Concentrations of additions, temperatures, energy of absorption of dehydrated and hydrated ions, and of interactions of these ions with polarized copper atom. Tables, graphs, diagram. 21 ref. (P15, Cu)

533-P. (Book.) **Ferromagnetic Domains.** K. H. Stewart. 188 p. 1954. Cambridge University Press, London, N.W. 1, England. 25S. Also 32 East 57th Street, New York 22, N. Y. $4.75.

Factors affecting behavior of individual domains, combination of domains in ferromagnetic structures, and properties of materials. (P16)

534-P. Thermal Conductivity. XI. Conductivity of Some Refractory Carbides and Nitrides. T. Vasilos and W. D. Kingery. *American Ceramic Society, Journal,* v. 37, Sept. 1954, p. 409-414.

Thermal conductivity of TiC, SiC, TiN and ZrN measured in temperature range 100 to 1000° C. Thermal conductivity decreased with increasing temperature. Graphs, tables, diagrams. 15 ref. (P11, H general, C-n)

535-P. Thermal Diffusivity of Metals at High Temperatures. D. Rosenthal and N. E. Friedmann. *Journal of Applied Physics,* v. 25, Aug. 1954, p. 1059-1060.

New technique and experimental data. 8 ref. (P11, Cu, Al)

536-P. On the Heats of Sublimation and Evaporation of Germanium. Richard E. Honig. *Journal of Chemical Physics,* v. 22, Sept. 1954, p. 1610.

Four species of germanium measured from 1100 to 1500° K. Diagrams, table. 7 ref. (P12, Ge)

537-P. Speculations on the Energy Band Structures of Ge-Si Alloys. Frank Herman. *Physical Review,* v. 95, ser. 2, Aug. 1, 1954, p. 847-848.

Relation between optical energy gap and composition. Diagrams. 6 ref. (P17, Ge, Si)

538-P. Temperature Variation of the Mean Debye Temperature of Cu_3Au, 20° C to 450° C. S. L. Quimby. *Physical Review,* v. 95, ser. 2, Aug. 15, 1954, p. 916.

Values calculated from crystalline

Cu_3Au at equilibrium order from elastic constants. Table. 6 ref. (P12, Cu, Au)

539-P. Thermoelectric Power and Electron Scattering in Metal Alloys. C. A. Domenicali and F. A. Otter. *Physical Review,* v. 95, ser. 2, Sept. 1, 1954, p. 1134-1142.

Empirical study of binary alloys of copper, silver, gold, alkali metals and aluminum. Graphs. 32 ref. (P15, EG-e, Cu, Ag, Au, Al)

540-P. (German.) **Increase of the Magnetic Permeability of Iron-Silicon and Iron-Aluminum Alloys by Low-Temperature Annealing in an Oxidizing Atmosphere.** Hermann Fahlenbrach and Eduard Houdremont. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 7-8, July-Aug. 1954, p. 377-381.

Effect of annealing time and furnace atmosphere. Graphs, tables, micrograph. 14 ref. (P16, J23, Si, Al, Fe)

541-P. The Thermodynamic Approach to Solid Structure. Vera Daniel. *British Journal of Applied Physics,* v. 5, Sept. 1954, p. 305-311.

Demonstrates advantages of thermodynamic methods for treatment of solids. Examples show that a clear understanding of what is thermodynamically possible can save a good deal of misunderstanding, and that measurement of thermodynamic data in some cases makes it possible to predict properties of materials where other methods are unwieldy or impracticable. Table, graphs, diagrams. 11 ref. (P12, Al, Cu)

542-P. Methods for Studying the Thermal Resistances of Sprayed and Electrodeposited Metal Coatings. R. W. Powell and M. J. Hickman. *British Journal of Applied Physics,* v. 5, Sept. 1954, p. 312-315.

Two methods for investigating additional thermal resistance introduced when plane end of a metal bar is coated with sprayed steel or an electrodeposited metal. Diagrams, graph, tables. 6 ref. (P11, L23, L17)

543-P. Temperature-Dependent de Haas-van Alphen Parameters in Zinc. Ted G. Berlincourt and M. C. Steele. *Physical Review,* v. 95, ser. 2, Sept. 15, 1954, p. 1421-1428.

Magnetic susceptibility of single crystal of zinc investigated from 4.2 to 300° K. in fields up to 25 kilogauss. Traces of the de Haas-van Alphen effect persisted at temperatures as high as 200° K. Graphs. 25 ref. (P16, Zn)

544-P. The Thermal Conductivity of Germanium and Silicon at Low Temperatures. H. M. Rosenberg. *Physical Society, Proceedings,* v. 67, no. 417A, Sept. 1954, p. 837-840.

Determinations at 2 to 100° K. Graphs. 8 ref. (P11, Ge, Si)

545-P. The Calculation of Heats of Formation of Binary Alloys. J. H. O. Varley. *Philosophical Magazine,* v. 45, 7th ser., no. 368, Sept. 1954, p. 887-916.

Theoretical treatment for calculating heats of formation of binary alloys for any composition. Diagram, tables, graphs. 17 ref. (P12)

546-P. Superconducting Elements. Julian Eisenstein. *Reviews of Modern Physics,* v. 26, July 1954, p. 277-291.

Magnetic and thermal properties of 21 metals. Tables. 74 ref. (P16, P11)

547-P. Thermionic Constants of Metals and Semiconductors. IV. Monovalent Metals. S. C. Jain and K. S. Krishman. *Royal Society, Proceedings,* v. 225, ser. A, Aug. 31, 1954, p. 159-172.

Detailed calculation of the effect of the thermal expansion of the lattice, and the increased thermal oscillations of the atoms in the lattice, associated with the rise in temperature, on the energy of the barrier at the surface. Diagram, tables. 15 ref. (P11, Cu, Ag, Au)

548-P. (French.) **Special Thermoelectric Elements.** Marcel Perrot and Georges Peri. *Comptes rendus,* v. 239, no. 7, Aug. 18, 1954, p. 537-539.

Studies of electromotive force obtained by compressing powdered aluminum, beryllium, and thorium oxides between two metallic plates. (P15, H14, Al, Be, Th)

549-P. Relationship Between Surface Tension of Liquid Chrome-Nickel Alloys and Some Properties in Their Solid State. O. S. Bobkova and A. M. Samarin. *Henry Brutcher, Altadena, Calif., Translation no.* 3373, 12 p. (From *Izvestiya Akademii Nauk SSSR, OTN,* 1954, no. 2, Feb., p. 52-59.)

Surface tension of liquid alloys in relation to hardness and impact values in the solid state after quenching or aging. Diagrams, graphs, tables. 2 ref. (P10, Q29, Q6, Cr, Ni)

550-P. (Russian.) **Temperature of Heating During Thermomagnetic Treatment of "Magnico" Alloy.** G. F. Golovin and A. A. Shekalov. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 8, Aug. 1954, p. 1503-1507 + 2 plates.

Magnetic properties and quenching temperature. Microstructures of tempered and untempered specimens. Graphs, micrographs. 4 ref. (P16, M27, J26, Fe, Co, Ni, Al, Cu)

551-P. Heat Content of Lead From 0 to 900°, and the Heat of Fusion. Thomas B. Douglas and James L. Dever. *American Chemical Society, Journal,* v. 76, Oct. 5, 1954, p. 4824-4826.

Compared with earlier studies. Tables, graph. 18 ref. (P12, Pb)

552-P. Permanent Magnets. *Edgar Allen News,* v. 33, Sept. 1954, p. 203-204.

Magnetic materials include Imperial permanent magnet steel, 6% tungsten, Hymax cobalt maget steels and Nial nickel-iron-aluminum magnet alloys. Photographs, graph. (To be continued.)
(P16, W, Co, Ni, Fe, Al)

553-P. Low-Energy Electron Diffraction Investigation of Chemisorbed Gases on the (100) Faces of Copper and Nickel Single Crystals. R. E. Schlier and H. E. Farnsworth. *Journal of Applied Physics,* v. 25, Oct. 1954, p. 1333-1336.

Equipment, procedures and results. Diagram, graphs. 6 ref. (P13, M22, Cu, Ni)

554-P. Heat Content of Molybdenum Disilicide From 0° to 900° C. Thomas B. Douglas and William M. Logan. *Journal of Research, National Bureau of Standards,* v. 53, Aug. 1954, p. 91-93.

Derivation of equation for values of relative heat content, heat capacity and relative entropy. Tables, graph. 3 ref. (P12, Mo, Si)

555-P. Properties of Zinc-, Copper-, and Platinum-Doped Germanium. W. C. Dunlap, Jr. *Physical Review,* v. 96, ser. 2, Oct. 1, 1954, p. 40-45.

Hall effect and resistivity measurements on single crystals. Diagram, graphs. 13 ref. (P15, Ge)

556-P. Optical Properties of Lead Telluride. Marvin E. Lasser and Henry Levinstein. *Physical Review,* v. 96, ser. 2, Oct. 1, 1954, p. 47-52.

Optical constants of films as function of both temperature and oxygen content. Graphs, diagrams. 18 ref. (P17, L, Pb, Te)

557-P. The Temperature Variation of Susceptibility of Tantalum. F. E. Hoare, J. S. Kouvelites, J. C. Matthews and J. Preston. *Physical Society, Proceedings,* v. 67, no. 417B, Sept. 1954, p. 728-730.

Magnetic susceptibility for range 0 to 2000° K. Graphs. 3 ref. (P16, Ta)

558-P. Measurement of the Electrical Resistance of Metals and Alloys at High Temperatures. P. Chiotti. *Review of Scientific Instruments,* v. 25, Sept. 1954, p. 876-883.

Method and apparatus to measure change in electrical resistance with temperature of refractory metals or alloys up to their melting point. Photographs, diagrams, circuit diagrams. 9 ref. (P15)

559-P. The Magnetic Anisotropy of Cobalt. W. Sucksmith and J. E. Thompson. *Royal Society, Proceedings,* v. 225, ser. A, Sept. 14, 1954, p. 362-375.

Measurements on variation of intensity of magnetization for single-crystal specimens cut along appropriate crystal axes, both for the hexagonal close-packed and face-centered cubic cobalt. Graphs, diagram, table. 20 ref. (P16, Co)

560-P. Effect of Nitrogen Upon Surface Tension and Crystallization of Austenitic Steels. N. S. Kreshchanovskii, V. I. Prosvirin and R. P. Zaletaeva. *Henry Brutcher, Altadena, Calif., Translation no.* 3372, 6 p. (From *Liteinoe Proizvodstvo,* v. 5, no. 1, 1954, p. 23, 24.)

Influence of nitrogen upon surface tension and primary crystallization pattern of various austenitic steels. Graph, photographs, table. 7 ref. (P10, N12, SS)

561-P. (English.) **Formation Energies of Vacancies in Copper and Gold.** C. J. Meechan and R. R. Eggleston. *Acta Metallurgica,* v. 2, no. 5, Sept. 1954, p. 680-683.

Experimental data for temperatures up to 950° C. give values of 0.90 e.v. for copper and 0.67 e.v. for gold. Tables, graphs. 14 ref. (P10, Cu, Au)

562-P. (German.) **Threshold Limit of the Current of the Superconductive Alloy Lead-Bismuth in External Magnetic Fields.** P. Grassmann and L. Rinderer. *Helvetica Physica Acta,* v. 27, no. 4, Aug. 1954, p. 309-312.

Investigation of dependence of induced current on strength of longitudinal or transverse magnetic fields. Deviations from analogous of pure metals. Graphs. 8 ref. (P16, Pb, Bi)

563-P. (German.) **The Optical Behavior of Metals at High Temperatures.** Günther Grass. *Zeitschrift für Metallkunde,* v. 45, no. 9, Sept. 1954, p. 538-547.

Theoretical and experimental study of the effect of temperature on the light-reflecting power of iron, nickel, cobalt, copper and manganese at temperatures up to 1200° C. Table,

diagrams, graphs, photographs. 24 ref. (P17, Fe, Ni, Co, Cu, Mn)

564-P. (Russian.) **Investigation of the Magnetostriction of an Iron-Nickel Alloy in Strong Magnetic Fields.** G. P. D'iakov and R. A. Reznikova. *Doklady Akademii Nauk SSSR,* v. 97, no. 4, Aug. 1, 1954, p. 633-634.

Studies on wire composed of 41% iron and 59% nickel. Graphs. 6 ref. (P16, Fe, Ni)

565-P. (Russian.) **Thermal Capacity of the Zeta-Phase of the Iron-Silicon System.** N. N. Serebrennikov and P. V. Gel'd. *Doklady Akademii Nauk SSSR,* v. 97, no. 4, Aug. 1, 1954, p. 695-698.

Experimental data for range of 0 to 1200° C. Table, graphs. 2 ref. (P12, M24, Fe, Si)

566-P. (Russian.) **Magnetostriction of Ferromagnetic Manganese Alloys.** D. I. Volkov. *Doklady Akademii Nauk SSSR,* v. 97, no. 5, Aug. 11, 1954, p. 809-811.

Effect of degree of ordering of atoms on saturation magnetostriction and saturation magnetism. Graphs. 4 ref. (P16, Mn)

567-P. (Russian.) **Certain Patterns in the Magnitude of the Thermal Conductivity of Semiconductors.** A. V. Ioffe and A. F. Ioffe. *Doklady Akademii Nauk SSSR,* v. 97, no. 5, Aug. 11, 1954, p. 821-822.

Effect of atomic and ionic crystal lattice structure on thermal conductivity of various halide, germanium, silicon, indium and antimony semiconductors. Tables, graphs. 2 ref. (P11, M26, Ge, Si, In, Sb)

568-P. Liquid Metals. I. The Surface Tension of Liquid Sodium: the Vertical-Plate Technique. C. C. Addison, D. H. Kerridge and J. Lewis. *Chemical Society, Journal,* 1954, Aug., p. 2861-2866.

Liquid sodium in argon atmosphere wetted zinc between 100 and 200° C. Copper and molybdenum were not wetted. Diagrams, tables, graphs. 10 ref.
(P10, Na, Cu, Mo, Zn)

569-P. Physical Chemistry of Steel. I. Theoretical Bases. J. A. Kitchener. *Iron & Steel,* v. 27, Oct. 1954, p. 473-478.

Thermodynamics and structure of solutions in liquid iron during the process of steelmaking. Graphs. 4 ref. (To be continued.)
(P12, D general, ST)

570-P. (English.) **The Electrical Resistivity of Cu-Ni Alloys and Matthiessen's Rule.** Yoshio Shibuya. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 3, June 1954, p. 199-206.

Resistivity versus composition curves for 23 and −183° C. are parabolic. Matthiessen's rule does not hold for copper-rich alloys. Table, diagram, graphs. 16 ref.
(P15, Cu, Ni)

571-P. (English.) **Statistico-Thermodynamical Studies on the Fundamental Reactions Concerning Steel-Making. II. The Equilibrium Relationship Between Oxygen and Carbon in Liquid Iron Under Various Pressures of CO Gas.** Sakae Takeuchi. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 3, June 1954, p. 207-219.

Computations show that departure from ideal solutions makes deoxidation by carbon possible only at low concentrations of carbon. Graphs. 11 ref. (P12, D general, ST)

572-P. (English.) **On the Solution-Body Phenomenon and Anisotropy of Solution Rate in Bismuth Crystals.** Mikio Yamamoto and Jiro Watanabé. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 3, June 1954, p. 233-243.

Solution rates are more anisotropic in nitric acid than in a nitric-hydrochloric mixture. Graphs, tables, diagrams, photographs. 17 ref. (P13, Bi)

573-P. (French.) **The Present State of Research on the Structure of Molten Silicates.** J. O'M. Bockris and J. D. Mackenzie. *Revue de métallurgie,* v. 51, no. 9, Sept. 1954, p. 658-664.

Electrical conductivity, transport number and viscosity of various silicates up to 1800° C. Probable mechanism of effects of metallic oxides on silica lattice. Diagrams, graphs. 13 ref. (P12, P10)

574-P. (Russian.) **Peculiarities of the Magnetostrictive Properties of Manganese-Tin Ferromagnetic Alloys.** D. I. Volkov and V. I. Leont'ev. *Doklady Akademii Nauk SSSR,* v. 97, no. 6, Aug. 21, 1954, p. 995-997.

Theoretical analysis of relations between longitudinal and transverse magnetostriction. Graphs. 8 ref. (P16, Mn, Sn)

575-P. (Russian.) **Optical Properties of Metals.** V. L. Ginzburg. *Doklady Akademii Nauk SSSR,* v. 97, no. 6, Aug. 21, 1954, p. 999-1002.

Theoretical and mathematical relations. Table. 7 ref.
(P17, Au, Ag, Cu, Sn)

576-P. (Russian.) **Theory of the Ball Effect in Ferromagnetics.** N. S. Aku-

lov and A. V. Cheremushkina. *Doklady Akademii Nauk, SSSR,* v. 98, no. 1, Sept. 1, 1954, p. 35-38.

Equations expressing relations of uneven effects to magnetic field and intensity of magnetization of monocrystals and polycrystals. Graphs. 6 ref. (P15, P16)

577-P. (Russian.) **Kinetic Equation for Electrons in Metals in Strong Fields.** V. P. Shabanskii. *Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki,* v. 27, no. 2(8), Aug. 1954, p. 142-146.

Analysis of collisions with the variation in absolute magnitude of electron impulse. 2 ref. (P15)

578-P. (Russian.) **Deviations From Ohm's Law in Metals.** V. P. Shabanskii. *Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki,* v. 27, no. 2(8), Aug. 1954, p. 147-155.

Large current densities produce erroneous estimates in current strength due to energy loss from electron collisions with lattice. 19 ref. (P15)

579-P. (Russian.) **Temperature Dependence of the Magnetostriction of Ferromagnetic Alloys.** D. I. Volkov and V. I. Chechernikov. *Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki,* v. 27, no. 2(8), Aug. 1954, p. 208-214.

Equipment and measuring methods. Graphs. 14 ref. (P16, Ni, Cu, Mn, Fe)

580-P. (Russian.) **Surface Tension and Heat of Evaporation of Mercury, Antimony, Bismuth, and Arsenic.** S. N. Zadumkin. *Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki,* v. 27, no. 2(8), Aug. 1954, p. 261-262.

Calculated values agree with experimental. Table. 2 ref. (P10, P12, Sb, Hg, Bi, As)

581-P. Metallurgical Effects of Ultrasonic Waves. Egon A. Hiedemann. *Acoustical Society of America, Journal,* v. 26, Sept. 1954, p. 831-842.

Survey includes vibration treatment of melts, mechanical vibrators, electromechanical transducers, induced electrical currents, ultrasonic treating, grain size, dispersion and rate processes. Diagrams, drawings, micrographs, graphs, macroetchings. 121 ref. (P10, S13)

582-P. Lattice Dynamics of Body-Centered and Face-Centered Cubic Metallic Elements. II. Jules de Launay. *Journal of Chemical Physics,* v. 22, Oct. 1954, p. 1676-1677.

A numerical table permits easy calculation of the Debye characteristic temperature of any cubic metallic element at 0° K. Tables. 5 ref. (P12, M22)

583-P. Optical and Photo-Electrical Properties of Indium Antimonide. D. G. Avery, D. W. Goodwin, W. D. Lawson and T. S. Moss. *Physical Society, Proceedings,* v. 67, no. 418B, Oct. 1954, p. 761-767.

Reflection and transmission measurements of InSb from 0.7 to 14 μ at temperatures of − 183 to 226° C. Photosensitivity extends to longer wave lengths than for any other known material. Graphs. 7 ref. (P17, P15, In, Sb)

584-P. The Vapour Pressure of Calcium. I. P. E. Douglas. **II.** D. H. Tomlin. *Physical Society, Proceedings,* v. 67, no. 418B, Oct. 1954, p. 783-794.

Relation of vapor pressure to absolute temperature. Diagrams, graphs, tables. 12 ref. (P12, Ca)

585-P. (English.) **On the Variational Calculation of the Activation Energy of Dislocation.** Akira Sugiyama. *Physical Society of Japan, Journal,* v. 9, no. 4, July-Aug. 1954, p. 460-464.

More rigid colculation shows Cottrell's approximation does not agree with experimental data. Graphs, tables. 4 ref. (P12, Q24)

586-P. (English.) **The Magnetostriction Constants of Silicon Steel. I.** Hideo Takaki and Yoji Nakamura. *Physical Society of Japan, Journal,* v. 9, no. 4, July-Aug. 1954, p. 507-511.

Tests on single crystal specimens with 0.7 and 1.8% silicon show Kaya's law of residual magnetization holds for these alloys. Tables, graphs. 14 ref. (P16, AY)

587-P. (German.) **Artificial Elements. I.** G. Herrmann. *Chemische Technik,* v. 6, no. 9, Sept. 1954, p. 494-502.

Transmutation of elements, study of radioactive and chemical properties of technetium, promethium, astatine and francium. Tables. (To be continued.) (P13, At, Fr, Pm, Te)

588-P. (German.) **The Stability of Superconducting State.** H. Koppe. *Zeitschrift für Naturforschung,* v. 9a, no. 9, Sept. 1954, p. 724-726.

Cylindrical region inside superconductor is not stable thermodynamically. 4 ref. (P12, P15)

589-P. (German.) **Coefficient of Vaporization of Liquid Potassium.** Kurt Neumann. *Zeitschrift für physikalische Chemie (Frankfurt),* v. 2, nos. 3-4, Oct. 1954, p. 215-228.

Reviews of vaporization of liquids, equipment and method for determination; evaluation of results show that the vaporization coefficient of molten potassium in vacuum is unaffected by temperature. Tables, diagrams, photograph, graphs. 19 ref. (P12, K)

590-P. (Russian.) **Certain Questions of the Quantum Mechanics Theory of the Ferromagnetism of Ferrites and Antiferromagnetism. I. Critical Review of Existing Theories.** S. V. Vonsovskii. **II. Quantum Mechanics Theory of Ferromagnetic Ferrites.** S. V. Vonsovskii and Iu. M. Seidov. **III. Antiferromagnetism of Transition Metals.** A. A. Berdyshev and S. V. Vonsovskii. *Izvestiia Akademii Nauk SSSR, Seriia Fizicheskaia,* v. 18, no. 3, 1954, p. 312-338.

Antiferromagnetic bond between crystal ions. Temperature dependence of spontaneous magnetization. Calculation of magnetic properties by consideration of valence electrons and electrons from incomplete inner shells of the atoms. Diagrams. 33 ref. (P16, Co, Fe, Ni)

591-P. (Book.) **Progress in Metal Physics.** Bruce Chalmers and R. King, editors, v. 5, 324 p. 1954. Interscience Publishers, Inc., 250 Fifth Ave., New York, N. Y. $9.50.

Consists of five articles individually abstracted.
(P general, M general, N general)

592-P. (Book.) **Thermal Conductivity of Metals and Alloys at Low Temperatures.** Robert L. Powell and William A. Blanpied. National Bureau of Standards Circular 556. 68 p. Government Printing Office, Washington 25, D. C. $0.50.

Useful but widely scattered data. Includes tables of measured values of thermal conductivity from room temperature down to approximately 0° K. (P11)

SECTION Q

MECHANICAL PROPERTIES and TEST METHODS; DEFORMATION

1-Q. The Geometry of the Pyramidal Indentation in the Hardness Testing of Involute Gear Teeth. N. J. C. Peres. *Australian Journal of Applied Science,* v. 4, Sept. 1953, p. 389-394.

Equations for obtaining true hardness values from indentations on curved surfaces. (Q29)

2-Q. The Effect of Iron, Manganese, and Chromium on the Properties in Sheet Form of Aluminium Alloys Containing 0.7% Magnesium and 1.0% Silicon. R. Chadwick, N. B. Muir and H. B. Grainger. *Institute of Metals, Journal,* v. 82, Oct. 1953, p. 75-80 + plates X-XIII.

After solution heat treatment and room-temperature aging, the mechanical properties varied only slightly with composition. Artificial aging increased susceptibility to intercrystalline corrosion. Table, diagrams. 16 ref. (Q general, R1, Al)

3-Q. The Effect of Cold Work on an Iron-Manganese Alloy. J. Gordon Parr. *Institute of Metals, Journal,* v. 82, Oct. 1953, p. 91, 92.

Metastable phases are produced in quantities which depend upon extent of cold working. Tables. 3 ref. (Q24, Fe, Mn)

4-Q. Impact Properties of Annealed Spheroidal-Graphite Cast Iron. A. L. Carr and W. Steven. *Metal Treatment and Drop Forging,* v. 20, Oct. 1953, p. 455-461.

Abridged version of authors' contribution to International Foundry Congress, in Paris, Sept. 19-27. Tests made in temperature range of −150 to +300° C. Transition temperature found to depend on silicon, manganese and phosphorus content. Photographs, tables, graphs. 13 ref. (Q6, CI, Si, Mg, Mn, P)

5-Q. Scratch Hardness Measurement With a Diamond Pyramid. T. Land and B. Sugarman. *Metal Treatment and Drop Forging,* v. 20, Oct. 1953, p. 464-466.

Based on paper presented before Sheet and Strip Metal Users' Technical Association. Comparison of scratch and indentation hardness tests. Photographs, graphs. 2 ref. (Q29)

6-Q. The Plastic Flow of Iron and Plain Carbon Steels Above the A_3-Point. P. Feltham. *Physical Society, Proceedings,* v. 66, no. 406B, Oct. 1953, p. 865-883.

Strain rate is function of applied stress, absolute temperature, latent heat of melting and volume per atom. Transient strain equation. Tables, graphs, diagrams. 31 ref. (Q24, Fe, Cn)

7-Q. Dislocations and Plastic Deformation. W. T. Read, Jr. *Physics Today,* v. 6, Nov. 1953, p. 10-13.

Reviews fundamental concepts concerning the above in certain ductile materials. Reports that small and exceedingly rare defects in structure of solids are "weak links" that determine strength of materials. Diagrams. 2 ref. (Q24, M26)

8-Q. (French.) **Modification of A-S 4 G by Sodium.** *Fonderie,* 1953, Sept., no. 92, p. 3613-3615.

Experiments for determining effect of sodium additions on mechanical properties and structure of light alloys with a low silicon content. Practical implications of results. Tables, graphs, micrographs. (Q general, M27)

9-Q. (French.) **Relationship Between Mechanical Characteristics and Texture of Directly Extruded Aluminum Alloys.** Jean Navarro and Robert Tertian. *Revue de l'Aluminium,* v. 30, no. 202, Sept. 1953, p. 299-306.

Mechanical properties influenced more by the complex textures in nonsymmetrical extrusions than by the normal textures of round and square extrusion. Photographs, diagrams, tables, micrographs. 4 ref. (Q general, Q24, Al)

10-Q. (French.) **The Behavior of Thick-Walled Pipes Submitted to High Pressures.** L. Deffet and J. Gelbgras. *Revue universelle des mines,* v. 9, ser. 9, no. 10, Oct. 1953, p. 725-740.

Various methods for measuring the distension. Results with mild and semihard steels. Photographs, tables, diagrams, graphs. 23 ref. (Q25, CN)

11-Q. (German.) **Alloying Elements in Steel and Their Importance in Steam-Boiler Design.** H. Buchholtz. *Brennstoff-Wärme-Kraft,* v. 5, no. 10, Oct. 1953, p. 358-359.

Mechanical properties of different alloy steels at elevated temperatures. Graph, table. (Q general, AY)

12-Q. (German.) **Comparison of Radiographic and Magnetic Methods of Determining Internal Stresses of Nickel.** Eugen Kappler and Ludwig Reimer. *Naturwissenschaften,* v. 40, no. 20, 1953, p. 523-524.

Literature review. 7 ref. (Q25, Ni)

13-Q. Fatigue Life of Thick-Skinned Tension Joints. Edward W. Thall, Jr. *Aeronautical Engineering Review,* v. 12, Nov. 1953, p. 37-46.

Tests run on number of panels representing various splice designs to determine ways of improving life of joint. Diagrams, photographs, graph. 1 ref. (Q7, K12)

14-Q. The Influence of Surface Rolling on the Fatigue Strength of Cast Iron. G. N. J. Gilbert and K. B. Palmer. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Oct. 1953, p. 71-77 + 1 plate.

Experiments on V-notched specimens of a pearlitic flake graphite cast iron. Graphs, photographs, tables. (Q7, G23, CI)

15-Q. Static Load Carrying Capacity of Steels. Effect of Heat Treatment. R. G. B. Yeo and T. Ko. *Iron & Steel,* v. 26, Nov. 1953, p. 498-500.

Investigations on effects of hardness of through-hardened carbon steel and of case thickness, variation of hardness, and prequenching treatment of Krupp steel. Photographs, graphs. 6 ref. (Q23, Q29, J general, CN, AY)

16-Q. Effects of Temperature on the Flow and Fracture Characteristics of Molybdenum. J. H. Bechtold. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers. Transactions,* v. 197, 1953, p. 1469-1475.

Tensile properties of annealed molybdenum were investigated from 1000 to −200° C. Graphs, photographs, diagram, table. 17 ref. (Q23, Mo)

17-Q. Bending of Molybdenum Single Crystals. K. T. Aust, R. Maddin and N. K. Chen. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1477-1482.

Lattice rotations occurring on tension and compression sides during bending of molybdenum single crystals at room temperature. Observations concerning crystallite rotations and slip traces. Crystallite fragmentation also noted. Table, graph, photographs, diagrams. 11 ref. (Q5, M26, Mo)

18-Q. Kink Band Formation in High Purity Aluminum During Creep at High Temperatures. Andre M. Gervais, John T. Norton and Nicholas J. Grant. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1487-1492.

X-ray Laue back-reflection technique was used in conjunction with metallographic studies to determine crystallographic elements involved in kinking and to measure rotations of bands. Diagrams, photographs, table. 16 ref. (Q3, Al)

19-Q. The Properties of Sand Cast Mg-Th-Zn-Zr Alloys. K. E. Nelson. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1493-1497.

Effect of thorium and zinc variations on strength and 100-hr. creep characteristics of magnesium, thorium, zinc and zirconium alloys. Tables, diagrams, photographs. 28 ref. (Q23, Q3, Mg, Th, Zn, Zr)

20-Q. Some Observations on the Work Hardening of Metals. E. H. Edwards, Jack Washburn and Earl R. Parker. *Journal of Metals,* v. 5, Nov. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1525-1529.

Mechanism of strain hardening is discussed in connection with some recent observations on stress-induced motion of dislocation boundaries and on shear deformation of zinc, cadmium and copper crystals. Graphs. 17 ref. (Q24, Zn, Cd, Cu)

21-Q. Design Properties of Metals. II. Strength in Tension. Robert L.

Stedfeld. *Machine Design,* v. 25, Nov. 1953, p. 161-170.

More effective use of tensile strength data. Graphs, photographs, table. 8 ref. (Q23)

22-Q. The Behavior of Metals Under Dynamic Loading. Donald S. Clark. *Metal Progress,* v. 64, Nov. 1953, p. 67-73.

Impact and strain propagation; dynamic stress-strain relations; delay of plastic strain; and pre-yield microstrain. Graphs, diagrams, table. (Q23)

23-Q. Effect of Iron on Hardness, Bend Properties and Welding of Titanium Sheet. W. J. Barth and A. L. Feild, Jr. *Metal Progress,* v. 64, Nov. 1953, p. 74-77.

Concludes that 0.5% iron has little effect on the room-temperature mechanical properties of commercial-purity alpha alloys such as RC-70, RS-70, Ti-100-A and MST Grade III, in the range of 55,000 to 70,000-psi. yield strength. Graphs, tables, photograph, micrographs.
(Q29, Q5, Q23, K general, Ti)

24-Q. Dislocations, Plastic Flow and Creep. N. F. Mott. *Royal Society, Proceedings,* v. 220, ser. A, Oct. 22, 1953, p. 1-14 + 4 plates.

Dislocations normally exist in crystalline solids; they are formed during crystal growth, and can move when the crystal is stressed. Theory of ductile fracture based on production of piled-up dislocations. The concept of "climb" of dislocations is introduced to explain recovery and creep. Diagrams, micrographs. 60 ref. (Q24, Q3, M26)

25-Q. Properties of Carbon and Alloy Steels Made With Sponge Iron. J. L. Morning and W. W. Stephens. *U. S. Bureau of Mines, Report of Investigations* no. 4975, Sept. 1953, 17 p.

Studies on the mechanical and physical properties of a series of steels. Tables. 7 ref.
(Q general, P general, Fe, CN, AY)

26-Q. (French.) **Determination of the Bursting Pressure of a Container From the Tensile Properties of the Metal.** Henri de Leiris and Paul Bastien. *Revue de métallurgie,* v. 50, no. 10, Oct. 1953, p. 683-696.

Use of Walmsley's theory for critical stress. Calculated and experimental data compared. Diagrams, tables. 11 ref. (Q23)

27-Q. (French.) **Relationship Between the Exact Shape of the Tensile Curve of Metals and the Simultaneous Modifications of Their Structure.** Ch. Crussard. *Revue de métallurgie,* v. 50, no. 10, Oct. 1953, p. 697-710.

Observations on polycrystals and monocrystals of various metals. Equations for predicting the elongation at which necking begins. New hypothesis on deformation bands. Tables, graphs, micrographs. 31 ref. (Q27)

28-Q. (French.) **Observations on Pieces Cracked or Broken in Service (Crankshafts, Helical Springs, Etc.)** Paul Coron. *Revue de métallurgie,* v. 50 no. 10, Oct. 1953, p. 711-724; disc., p. 724-726.

Microscopic observations of cracks and fractures of cast iron and steel pieces at ordinary temperatures from mechanical causes. Method for determining the cause and eliminating occurrence of service failures. Photographs. 133 ref. (Q26, CI, CN)

29-Q. (German.) **Novel X-Ray Diffraction Technique for Measuring Internal Stresses in Metals.** I. Szanto. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 1-2, 1953, p. 165-186.

A new method of testing steel has made attainable a degree of precision identical with current radiographic techniques, but by a much simpler measuring procedure. Tables, graph, photographs, diagrams. 15 ref. (Q25, ST)

30-Q. Metallurgical Topics. *Engineer,* v. 196, Nov. 6, 1953, p. 592-593.

Bend and tensile tests on steels and experiments on steel tubes under internal pressure. Graphs, tables. (Q5, Q27, ST)

31-Q. The Design of Creep-Resisting Steels. E. W. Colbeck, J. R. Rait and J. O. Ward. *Engineering,* v. 176, Oct. 23, 1953, p. 537-540.

Effects of various alloying elements. Diagram, photographs, tables, graphs. 28 ref. (Q3, AY)

32-Q. Influence of Section Size on the Strength Properties of Non-Ferrous Sand Castings. W. J. Reichenecker. *Foundry,* v. 95, Nov. 19, 1953, p. 627-628.

Includes graphs, table, diagram. (Q23)

33-Q. The Initiation of Brittle Fracture at Welded Joints in Steel Structures. W. G. Warren and H. G. Vaughan. *Institute of Welding, Transactions,* v. 16, Oct. 1953, p. 127-135.

Under certain conditions fissured weld metal can precipitate brittle fracture in a weldment. Results of an investigation of factors involved in fissuring; means of its minimization. Photographs, tables, diagrams. (Q26, K general, ST)

34-Q. How to Develop Favorable Stress Patterns. I. J. E. Campbell and H. O. McIntire. *Iron Age,* v. 172, Nov. 12, 1953, p. 185-188.

Favorable surface stresses can increase fatigue life and can be obtained by selection of proper steel grades, size and heat treatment. Graphs, tables. (Q25, J general)

35-Q. Martensite Bad Medicine for Drilling Lines. C. M. Zerr. *Oil and Gas Journal,* v. 52, Nov. 30, 1953, p. 79-80, 82, 84.

Not all wickering is a result of martensite. Other, correctable factors may be responsible. Photographs. (Q9, M27, CN)

36-Q. (English.) **Study on High Chromium Steels. I. On the Anomaly of Alpha Solid Solution of Fe-Cr System at High Temperatures.** Yonoshin Imai and Kenzaburo Kumada. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 3, June 1953, p. 218-226.

Experimental study to determine cause of brittleness at 475° C. Graphs, tables. (Q23, AY)

37-Q. (English.) **On the Microhardness of Aluminium Single Crystal.** Takeo Hikage. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 3, June 1953, p. 254-262.

Investigation on annealed aluminum before and after deformation by stretching. Graphs, diagrams, micrographs, tables. 5 ref. (Q29, Q24, Al)

38-Q. Biaxial Fatigue Properties of Pressure Vessel Steels. C. E. Bowman and T. J. Dolan. *Welding Journal,* v. 32, Nov. 1953, p. 529s-537s.

Investigation to determine relative abilities of carbon and low alloy steels to resist cyclic loading with and without stress raisers imposed by design and fabrication. Graphs, photographs, diagrams, tables. 6 ref. (Q7, CN, AY)

39-Q. Transition Temperatures of Structural Steel Beams With Butt-Welded Splices. William J. Krefeld and George B. Anderson. *Welding Journal,* v. 32, Nov. 1953, p. 538s-576s.

Investigation of resistance of butt-welded and unwelded structural beams to impact loads at low winter temperatures. Relative behavior of semikilled and fully killed steels and low-hydrogen versus ordinary electrodes. Graphs, tables, diagrams, photographs. 3 ref. (Q6, K1, CN)

40-Q. A Survey of Embrittlement and Notch Sensitivity of Heat Resisting Steels. George Sachs and W. F. Brown. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 6-20; disc. p. 21-24.

Results of series of experiments. An attempt to determine general effects of important variables; to show relationship of the phenomena observed; and to suggest mechanism for the embrittlement. Graphs, table. 23 ref. (Q23, AY)

41-Q. Influence of Sharp Notches on the Stress-Rupture Characteristic of Several Heat-Resisting Alloys. W. F. Brown, Jr., M. H. Jones and D. P. Newman. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 25-45; disc., p. 46-48.

Stress-rupture tests carried out on a number of low alloy steels, ferritic stainless steels and austenitic alloys. Unnotched and sharply notched bars tested at various temperatures. Ductilities determined. Graphs, micrographs. 9 ref. (Q4, AY, SS)

42-Q. Effect of a Notch and of Hardness on the Rupture Strength of "Discaloy". F. C. Hull, E. K. Hann and H. Scott. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 49-58; disc., p. 58.

Creep-rupture and notched bar rupture tests conducted at 1000 and 1200° F. Plain bar rupture strength reached a maximum at a hardener content producing 2% rupture strain. Notched-bar strength exceeded plain bar strength in material in which creep specimen had more than 5% rupture strain. Diagrams, graphs, tables. (Q3, Q4, SS)

43-Q. Notch Rupture Tests of Inconel X and Nimonic 80A. D. E. Furman and A. M. Talbot. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 59-65.

Tests at 1100, 1350, and 1500° F. on Inconel "X" and at the two latter temperatures on Nimonic 80 A. Both materials were found to be insensitive to shallow, sharp notches at 1350° F., suggesting that accidental surface imperfections would have small effect on the service life of these alloys. Tables, graphs. 3 ref. (Q4, Ni)

44-Q. Effect of Notch Geometry on Rupture Strength at Elevated Tem-

peratures. E. A. Davis and M. J. Manjoine. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 67-87; disc., p. 88-92.

Three series of creep-rupture tests of notch bars with varying geometry of the notch were performed at elevated temperatures on several heat resistant alloys. Effect on notch sensitivity of stress level, grain size, hardness, ductility and heat treatment investigated. Table, graph, micrograph. 9 ref. (Q3, Q4, SS)

45-Q. Investigations Into the Influence of Notches on Creep Strength at High Temperatures. W. Siefried. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 93-130.

Investigations principally on austenitic steels as used in the construction of stationary gas turbines. Table, graphs, photographs, micrographs. 5 ref. (Q3, SS)

46-Q. Theory of Time-Dependent Rupture and Interpretation of Some Stress-Rupture Data. D. N. Frey. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 131-137; disc., p. 138-141.

Effect of precipitation upon rupture time and ductility and effect of circumferential notches on elevated temperature rupture strength. Graphs, micrographs. 11 ref. (Q4)

47-Q. The Effect of Grain Size Upon the Fatigue Properties at 80°, 1200°, and 1600° F of "Precision Cast" Alloy X-40. P. R. Toolin. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 142-159; disc., p. 160-162.

Notch sensitivity of carefully ground notches was greater at 1200° F. than at either room temperature or 1600° F. Machined notches have higher fatigue strengths at room temperature and 1200° F. than carefully ground notches. Some tensile strengths are also reported. Tables, graphs, micrographs. 17 ref. (Q7, SS)

48-Q. Recovery and Creep in an Alloy Steel. H. A. Lequear and J. D. Lubahn. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 163-178; disc., p. 180-183.

Interrupted creep tests demonstrated recovery in Cr-Mo-V steel at 1000° F. but not at 800° F. Diagrams, graphs, photographs, table. 6 ref. (Q3, N4, AY)

49-Q. An Experimental Study of the Strength and Ductility of Steel at Elevated Temperatures. J. Glen. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 184-221; disc., p. 222-224.

Tests explain many effects of alloying elements on creep resistance and ductility of steels under various conditions. It was concluded that the factor largely determining such effects was precipitation. Graphs, tables. 14 ref. (Q23, Q3, N7, CN, AY)

50-Q. Effect of Sigma on Strength and Ductility of 25 Cr, 20 Ni Steel. G. V. Smith and E. J. Dulis. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 225-235; disc., p. 236.

Sigma causes moderate strengthening at room temperature, severe loss in toughness even at temperatures as high as 500° F., and moderate loss of creep-rupture strength at 1300° F. Tables, graphs, micrographs. (Q23, Q3, Q4, SS)

51-Q. The Structure and Properties of Stainless Steels After Exposure at Elevated Temperatures. A. B. Wilder and E. F. Ketterer. Paper from "Symposium on Strength and Ductility of Metals at Elevated Temperatures". American Society for Testing Materials, Technical Publication no. 128, p. 237-246; disc., p. 247-249.

A number of ferritic and austinitic stainless steels were exposed at temperatures of 900 to 1200° F. for periods up to 34 000 hr. Microstructure of the weld heat effected zone and parent metal and tensile and creep rupture properties of the parent metal. Diagram, tables, graphs, micrographs. 4 ref. (Q23, Q3, Q4, M27, SS)

52-Q. (German.) **The Creep Behavior of Zirconium-Alloyed Steels at 500 C.** Wilhelm Anton Fischer. *Archiv für das Eisenhüttenwesen*, v. 24, nos. 9-10, Sept.-Oct., 1953, p. 397-400.

Zirconium steels quenched at 1000 to 1200° C. and annealed at 600° C. shown to have a lower creep

strength than other special carbide-forming steels. Tables, graphs. 13 ref. (Q3, AY)

53-Q. (German.) **A Mathematical Equation for the Stress-Strain Curve of the Tensile Test.** Alfred Krisch. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct., 1953, p. 401-405.

Literature review and critical discussion and expansion by H. I. Fusfield's and H. Kostron's formulas to permit consideration of small tensile deformations. Tensile strength of unalloyed and alloyed steels. Tables, graphs. 19 ref. (Q27, CN, AY)

54-Q. (German.) **The Bending Yield Point, an Additional Characteristic of Thin Sheet Metals.** Walter Fackert. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct., 1953, p. 407-410.

Critically discusses earlier tests of the suitability of sheet metals for the manufacture of containers. New testing device, its operation and results. Table, graphs, photographs, diagrams. 2 ref. (Q5)

55-Q. (German.) **Effect of Low-Temperature Deformation on the Properties of Stainless Austenitic Steels.** Karl Bungardt, Rudolf Oppenheim and Robert Scherer. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, Sept.-Oct., 1953, p. 423-430.

Tests made to determine effects of low temperature (−70 and −180° C.) on mechanical properties, magnetic saturation and chemical resistance. Tables, graphs, micrographs.
(Q general, P16, R general, SS)

56-Q. (Russian.) **Influence of Plastic Deformation Arising During the Decomposition of a Solid Solution on the Rate of Growth of the Nucleus of a New Phase.** L. N. Aleksandrov and B. Ia. Liubov. *Doklady Akademii Nauk SSSR,* v. 91, no. 3, July 21, 1953, p. 519-522.

Influence of stress state generated by transformation itself gives the process an auto-catalytic character. 7 ref. (Q24, N6)

57-Q. (Book.) **Analysis of Deformation.** K. Swainger. v. 1. 1953. Chapman & Hall, Ltd., 37-39 Essex St., London, W.C. 2, England. £3-5-0.

Formulation of mathematically linear theory analyzing deformation. Draws general inferences without solving equations and boundary conditions for particular cases. (Q24)

58-Q. (Book.) **Symposium on Strength and Ductility of Metals at Elevated Temperatures.** ASTM Special Technical Publication no. 128. 249 p. 1952. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $3.25.

Particular reference is made to effects of notches and metallurgical changes. Individual papers are separately abstracted. (Q23, Q3, Q4)

59-Q. (Book—German.) **(Technical Hardness Measurements) Technische Härtemessung.** Herbert von Weingraber. 374 p. 1952. Carl Hanser Verlag, Munich 27, Germany. DM.36.00.

Deals with all aspects of hardness testing of metals and nonmetals, including concept of hardness in materials technology, methods of testing, equipment, and applications. (Q29)

60-Q. **Steel Testing and Design. II.** W.A. Martin. *Canadian Metals,* v. 16, Dec. 1953, p. 36, 38.

Tests for determination of strength and ductility. 8 ref. (To be continued.) (Q23, ST)

61-Q. **Some Considerations in Steel Testing and Design.** W. A. Martin. *Canadian Metals,* v. 16, 1953, p. 42, 44.

Design practice, embrittlement, mechanical tests and transition temperatures. 3 ref. (Q general, ST)

62-Q. **Fatigue Testing of Wire Ropes.** U. Rossetti. *Engineers' Digest,* v. 14, Nov. 1953, p. 425-426, 444. (Translated from *l'Ingegnere,* v. 27, no. 7, July 1953, p. 769-771.)

Apparatus which can be used for standard fatigue strength tests, as well as for the determination of the effects of different types of dynamic load conditions. Diagrams, tables. (Q7)

63-Q. **A Survey of Rapid Fatigue Test Methods.** G. Vidal. *Engineers' Digest,* v. 14, Nov. 1953, p. 433-435. (Translated from *La Recherche Aeronautique,* no. 34, July-Aug. 1953, p. 49-54.)

Concludes no accelerated method gives a reliable indication of the fatigue limit. However, with caution, some of these methods may be used as approximations, thereby reducing the number of tests required by the strict method. Graphs, diagrams. 14 ref. (Q7)

64-Q. **Calculating Flexibility for Straight Line Piping Elements.** L. E. Partch. *Heating, Piping & Air Conditioning,* v. 25, Dec. 1953, p. 74-77.

Includes diagrams, photographs. (Q23)

65-Q. **Some Creep Characteristics of a Group of Precipitation-Hardening Alloys Based on the Alpha-Copper-Aluminium Phase.** J. P. Dennison. *Institute of Metals, Journal,* v. 82, Nov. 1953, p. 117-128.

Hardness and metallographic data used to investigate structural changes occurring on reheating solution-treated alloys, including specimens cold worked before aging. Graphs, tables. (Q3, Cu)

66-Q. In Carburized Bars—How to Develop Favorable Stress Patterns. II. J. E. Campbell and H. O. McIntire. *Iron Age,* v. 172, Nov. 26, 1953, p. 102-105.

Patterns determined for pack, gas, and liquid carburized bars after various quenching and tempering treatments. Graphs, tables. (Q25, J28, CN)

67-Q. How to Improve Bending Properties of Titanium Strip. W. M. Baldwin, Jr. *Iron Age,* v. 172, Dec. 3, 1953, p. 165-167.

Embrittlement resulting from oxygen and nitrogen absorption during annealing or hot rolling corrected by removing a thin layer of surface metal by grinding or pickling. Graphs. 4 ref. (Q5, J23, Ti)

68-Q. A Crystallographic Analysis of the Ductile-Brittle Transition in Body-Centered Cubic Single Crystals. A. J. Opinsky. *Journal of Metals,* v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1650-1651.

Laws of critical normal stress for cleavage and critical shear stress for slip explain orientation and temperature dependence of transition in metals. Diagrams. 3 ref. (Q24)

69-Q. After-Effects in Polycrystalline Cadmium. Charles S. Barrett. *Journal of Metals,* v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1652-1654.

Torsional after-effect is interrupted by an abnormal twisting when film on wire is removed by etching. This is accounted for by the pile-up of dislocations beneath the film during original twisting and relief of residual stresses by elastic and plastic processes during etching. Graph. 8 ref. (Q1, Cd)

70-Q. Torsional After-Effect Measurement and Applications to Aluminum. C. S. Barrett, P. M. Aziz and I. Markson. *Journal of Metals,* v. 5, Dec. 1953; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1655-1661.

Abnormal after-effect in twisted wires that occurs when untwisting is interrupted by etching can be brought under control and used to study the mechanical properties of thin surface films and how they are affected by reagents and heat treatment. Results of studies of oxide films on high-purity aluminum. Graphs, diagrams. 4 ref. (Q1, Al)

71-Q. Band Structure in Disordered Alloys and Impurity Semiconductors. Hubert M. James and Arthur S. Ginzbarg. *Journal of Physical Chemistry,* v. 57, Nov. 1953, p. 840-847; disc., p. 847-848.

Mathematical analysis of a one-dimensional model. Graphs. 14 ref. (Q24, N10)

72-Q. Creep Tests in Inert Atmospheres. A. J. Fenner and G. Willoughby. *Journal of Scientific Instruments,* v. 30, Nov. 1953, p. 406-407.

Construction and operation of apparatus using rhomb and mirror extensometers of the kind widely used for high-sensitivity creep tests in air. Diagram, photograph. (Q3)

73-Q. Metallurgy. II. Fatigue Properties of Steels. J. Clayton-Cave and E. Ineson. *Metal Treatment and Drop Forging,* v. 20, Nov. 1953, p. 553-556.

Research program and facilities of the BISRA. Photographs, diagrams. (Q7, A9, ST)

74-Q. The Measurement of Engine Wear by the Use of Radio-Isotopes. *Petroleum,* v. 16, no. 12, Dec. 1953, p. 358-361.

Precautionary measures and test equipment and procedures. Graph, photographs. (Q9, S19)

75-Q. A Quantitative Study of the Wear Process. E. Rabinowicz. *Physical Society, Proceedings,* v. 66, no. 407 B, Nov. 1953, p. 929-936.

Determination of the mass of wear fragments using autoradiographic techniques. Graphs, diagrams. 7 ref. (Q9, Cu, CN)

76-Q. Finite Plane Strain. J. E. Adkins, A. E. Green and R. T. Shield. *Royal Society of London, Philosophical Transaction,* v. 246, ser. A, no. 910, Oct. 29, 1953, p. 181-213.

General theory of plane strain, valid for large elastic deformations of isotopic materials. 22 ref. (Q21)

77-Q. Effects of Alternating Strain on the Structure of Metal. W. A. Wood and R. B. Davies. *Royal Society, Proceedings,* v. 220, ser. A, Nov. 10, 1953, p. 255-266 + 3 plates.

Effects on crystalline structure of successive unidirectional tensile strains are compared with effects of the same strains applied alternately in tension and compression. Graphs, diffraction patterns. 8 ref. (Q27, Q28, M26, Cu)

78-Q. (English.) **Alloy Steels. A Survey Given at the 4th International Mechanical Engineering Congress, June**

5th, 1952. Helmer Nathorst. *Metalen,* v. 8, no. 20, Oct. 31, 1953, p. 363-367.

Yield point and elastic limit of austenitic stainless steels and effect upon machinability. Graphs, micrographs. 21 ref. (Q23, G17, SS)

79-Q. (German.) **Problems of Standardizing Hardness Testing.** E. Kruse. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 19, no. 10, Oct. 1953, p. 295-299.

Definitions of terms, testing methods, equipment and correlation between hardness and other properties. Graph. (Q29, ST, Al, Be)

80-Q. (German.) **Creep Strength and Embrittling of Ferritic Steels at 550° C.** E. Theis. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 19, no. 10, Oct. 1953, p. 300-315.

Testing procedure and results for determining effects of composition and heat treatment on creep strength of 15 steels. Photographs, tables, diagrams, graphs. (Q3, Q23, J general, SS)

81-Q. (German.) **The Preparation and Investigation of Pure and Intentionally Contaminated Iron.** Johan D. Fast. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1484-1496.

Effects of various impurities on strain aging, blue brittleness, and grain boundary brittleness. Diagrams, photographs, tables, graphs. 39 ref. (Q23, Fe)

82-Q. (German.) **The Development of Heat Resisting Steels Showing High Strength at Elevated Temperatures.** Karl Bungardt. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1496-1503.

Factors effecting creep behavior and corrosion resistance of steels. Tables, graphs. 13 ref. (Q3, R general, AY)

83-Q. (German.) **Phenomena Encountered in Stressing Materials by Fatigue.** Max Hempel and Eduard Houdremont. *Stahl und Eisen,* v. 73, no. 23, Nov. 5, 1953, p. 1503-1511.

Determination of reliable bases for calculating behavior of materials under different stress conditions. Changes in structure of soft steel after cold deformation and alternate stressing. Graphs, micrographs, diagrams. 11 ref. (Q7, M27, ST)

84-Q. (German.) **Improving the Plastic Compression Test by Forced Glide Friction.** Ernst Mönch. *Zeitschrift für angewandte Physik,* v. 5, no. 10, Oct. 1953, p. 363-369.

New method used for celluloid but also applied to aluminum. Purpose of experiments, experimental arrangement, preparation of specimens and results. Photographs, micrographs, graphs. 5 ref. (Q28, Al)

85-Q. (German.) **The Laws of Plastic Deformation of Metals Under a Multiaxial State of Tension. I. Theoretical Basis.** Werner Sautter, Albert Kochendörfer and Ulrich Dehlinger. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 442-449.

Experimental investigations on combined tension and torsion tests of aluminum tubes and on their theoretical interpretation on the basis of known plasticity theories. Graphs. 30 ref. (Q24)

86-Q. (Hungarian.) **Defects of Surface and Quality of Steel Wire.** Lajos Mankher. *Kohaszati Lapok,* v. 8, no. 11, Nov. 1953, p. 225-239.

Conditions to be fulfilled by basic material as well as mechanical and technological properties of drawn wire resulting from structural changes taking place during processing. Photographs, micrographs. (Q general, F28, AY)

87-Q. (Italian.) **Shear Strength Test of Light Metals.** F. Gatto. *Alluminio,* v. 22, no. 5, Oct. 1953, p. 495-506.

Testing method which demonstrates value of shear breaking load. Photo-elastic examination of stress conditions of the sample indicated value of the test. Tables, photographs, micrographs, diagrams. (Q2, Cu, Mg, Zn)

88-Q. (Italian.) **An Electro-Acoustic Method for Measuring Thermo-Elasticity.** F. Gatto. *Alluminio,* v. 22, no. 5, Oct. 1953, p. 507-521.

Application of method to measuring elastic constants, hardness and recrystallization of aluminum. Tables, graphs, photographs, diagrams. 22 ref. (Q21, Q29, N5, Al)

89-Q. (Russian.) **Internal Friction and Shear Modulus of Pure Copper and Beryllium Bronze.** V. S. Postnikov. *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 79-82.

Studies on internal friction and shear modulus as depending on temperature and soaking time. Graphs. 6 ref. (Q22, Q2, Cu, Be)

90-Q. (Russian.) **Intermittent Deformation on the Linear "Elastic" Portion of the Tensile Strength Diagram.** N. F. Siutkin. *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 83-85.

Testing on aged and tempered wire. Tempering was done at 375° C. in 15° C. water and aging time was 250 hr. Graphs. 3 ref. (Q27)

91-Q. (Russian.) **Problem of the Nature of the Fracture Strength of Metals.** V. A. Pavlov. *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 253-255.

Studies of the change of metal properties during plastic deformation by measuring the ratio of impact strength to the magnitude of plastic deformation. Graphs. 4 ref. (Q26, Q24, Q6)

92-Q. (Russian.) **Microhardness of Diffused Silicon Coatings.** N. S. Gorbunov, A. S. Akopdzhanian and N. A. Izgaryshev. *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 285-286.

The greater the amount of carbon in the covered metal the greater the microhardness of the diffused silicon coating. Graphs, micrographs. 3 ref. (Q29, L15)

93-Q. (Russian.) **Complex Manifestation of Plastic Deformation of Monocrystals.** A. B. Zemtsov, M. V. Klassen-Nekliudova and A. A. Urusovskaia. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 813-816 + 1 plate.

Translucence of thallium bromide and thallium iodine in visible rays and possibility of studying them in polarized light permitted demonstration of mechanics of deformation. Micrographs, diagrams. 8 ref. (Q24, T1)

94-Q. (Russian.) **Influence of the Size Relationship of Friction Surfaces and Degree of Hardness on the Slide Conditions of Machine Parts in Contact.** D. N. Garkunov and I. V. Kragel'skii. *Doklady Akademii Nauk SSSR,* v. 91, no. 5, Aug. 11, 1953, p. 1085-1088.

Friction pairs such as copper on aluminum, steel on aluminum and steel on chromium steel. Diagrams, tables, graphs, micrographs. 3 ref. (Q9, Al, Cu, ST, CN)

95-Q. (Russian.) **Study of the Deformed State With the Help of Radioactive Isotopes.** S. I. Gubkin and S. A. Dovnar. *Doklady Akademii Nauk SSSR,* v. 91, no. 5, Aug. 11, 1953, p. 1089-1090.

Radiographs permit examination of degree of change at each point and main direction of deformation at its terminal moment. Method shown to be particularly valuable for terminal plastic processes. Micrograph. (Q24, S19)

96-Q. (Russian.) **Investigation of Wear of Piston Rings.** R. V. Kugel. *Vestnik Mashinostroeniia,* v. 33, no. 8, Aug. 1953, p. 32-36.

Problem of a more rational chromium plating of oil rings. Diagrams, tables. 5 ref. (Q9, L17)

97-Q. Some Notes on Creep of High Temperature Alloys. W. T. Pether. *Australasian Engineer,* 1953, Oct., p. 95-99, 101, 103, 105, 107, 109.

Resumé of a paper presented to the Foundry and Metals Institute of Western Australia. (Q3)

98-Q. Brinell Hardness Numbers for Various Loads. Vincent E. Laysaght. *Materials & Methods,* v. 38, Dec. 1953, p. 145.

Data sheet reprinted from "Indentation Hardness Testing," Reinhold Publishing Corp., 1949. (Q29)

99-Q. Work Hardening of Metals. *Metal Industry,* v. 83, Nov. 27, 1953, p. 446.

Slip and theories of cold work hardening. 3 ref. (Q24)

100-Q. A Progress Report on Brass. D. C. Bradley and W. R. Toeplitz. *Metal Powder Association, Proceedings,* 1953, p. 69-76; disc., p. 76-77.

Mechanical properties of pure iron and various copper alloys. Precautions necessary for production of satisfactory parts. Photographs, graphs.
(Q general, H general, Cu, Zn, Pb, Sn, Fe)

101-Q. Alloy Powders by the Hydride Process. B. A. Gruber. *Metal Powder Association, Proceedings,* 1953, p. 95-99; disc., p. 99-101.

Mechanical properties of chromium-nickel alloy steels made from powders. Tables, graphs.
(Q general, H general, Cr, Ni, AY)

102-Q. American Developments in Alloys for High Temperatures. C. L. Clark. *Metal Progress,* v. 65, Jan. 1954, p. 72-76.

Compositions and mechanical properties of low and high-alloy steels and other heat resistant alloys. Graphs, tables.
(Q general, SS, SG-h)

103-Q. How Tough Are Nickel and Chromium Electroplates for Aluminum? Henry Paige, J. H. James and F. S. Williams. *Product Engineering,* v. 24, Dec. 1953, p. 162-167.

Value of nickel and chromium electroplated high-strength Al has been revealed in a series of corrosion and mechanical strength studies. Tables, graphs, photographs.
(Q general, R general, Ni, Cr, Al)

104-Q. A Comparison Between the Swift Cupping Press and the Tensile Test for the Assessment of the Aluminium-Magnesium Series of Alloys for Deep Drawing and Pressing. Roger Pearce. *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1077-1080.

Investigation to examine all commercial aluminum-magnesium alloys in all their conditions to discover which is the best to use for mass-production press work. Tables, photograph, diagram. (Q23, Mg, Al)

105-Q. Thorium Improves Magnesium Alloys. *Steel,* v. 133, Dec. 14, 1953, p. 126, 128.

Castings made with experimental alloys indicate they will be easier to handle than rare earth alloys. Thorium makes alloying with zirconium easier and ups recoveries. Tables. (Q general, Mg)

106-Q. Steel Below Zero. O. A. Battista. *Steelways,* v. 9, Dec. 1953, p. 28-31.

Studies in effects of low temperatures on steels. Photographs, diagram. (Q general, ST)

107-Q. A Study of Elastic and Plastic Stress Concentration Factors Due to Notches and Fillets in Flat Plates. Herbert F. Hardrath and Lachlan Ohman. *U. S. National Advisory Committee for Aeronautics, Report* 1117, 1953, 10 p.

Six large 24S-T3 aluminum alloy sheet specimens containing various notches or fillets were tested in tension to determine their stress concentration factors in both elastic and plastic ranges. Diagrams, graphs, table. 12 ref. (Q21, Q23, Q25, Al)

108-Q. Experimental Stress Analysis of Stiffened Cylinders With Cutouts. Pure Torsion. Floyd R. Schlechte and Richard Rosecrans. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3039, Nov. 1953, 41 p.

Torsion tests made on a cylindrical semimonocoque shell of circular cross section. Diagrams, graphs, photographs, tables. 5 ref. (Q25, Al)

109-Q. Application of Silver Chloride in Investigations of Elasto-Plastic States of Stress. L. E. Goodman and J. G. Sutherland. *U. S. National Advisory Committee for Aeronautics, Technical Note,* 3043, Nov. 1953, 55 p.

Quantitative relationships between the state of elastic or plastic stress in a specimen and observed relative retardation and extinction angle developed from a general theory of stress birefringence. Micrographs, graphs, tables. 22 ref. (Q25)

110-Q. Behavior of Carbon and Low-Alloy Steels Between −20 and +650° F. G. H. Enzian. *Welding Journal,* v. 32, Dec. 1953, p. 605s-618s.

Demonstrates that certain pressure vessel steels may be susceptible to phenomenon of brittleness in these temperature ranges. Appropriate precautions to be observed in critical applications. Graphs, tables. 59 ref. (Q23, CN, AY)

111-Q. (French.) Steels Resistant to Temperatures Greater Than 450° C. I. Georges Vidal. *Chaleur & Industrie,* v. 34, no. 340, Nov. 1953, p. 305-314.

Resistance to creep; structural stability; resistance to oxidation by air or to corrosion by certain industrial atmospheres; resistance to abrasion; and resistance to alternating stresses. Micrographs, photographs, diagrams, graphs. (To be continued.) (Q3, R3, AY, SS, Ni)

112-Q. (French.) The Presence of Preferred Micro-Domains of Attack in a Copper-Zinc Polycrystalline Solid Solution Very Slightly Deformed by Tension. Pierre A. Jacquet. *Comptes rendus,* v. 237, no. 20, Nov. 16, 1953, p. 1248-1250.

Slip lines scarcely visible on electrolytically polished surface are revealed by a special etching technique. (Q24, Cu, Zn)

113-Q. (French.) Comparative Study of the Wear of Materials Subjected to Friction. R. de Fleury. *Revue de l'Aluminium,* v. 30, no. 203, Oct. 1953, p. 341-345.

Endurance criterion of materials submitted to friction is the work that the material can elastically absorb per unit volume. Diagram. 6 ref. (Q9, Al, ST)

114-Q. (French.) The Study of Foundry Alloy A-Z5G. Louis Grand. *Revue de l'Aluminium,* v. 30, no. 204, Nov. 1953, p. 385-390.

Mechanical properties, workability and corrosion resistance. Tables, graphs, photographs. (Q general, R general, Al, Zn, Mg)

115-Q. (French.) Rotating Bending Tests on Specimens of Medium Size. P. Coron. *Revue de métallurgie,* v. 50, no. 11, Nov. 1953, p. 761-767.

Machine designed to carry out tests to compare cracks of forged and machined crankshafts and to examine effect of metallic coatings on behavior of axles in service. Diagrams, micrographs. 32 ref. (Q5)

116-Q. (Italian.) Fatigue Tests on Steel Softened by Cold Straining. L. Matteoli and B. Andreini. *Metallurgia italiana,* v. 45, no. 9, Sept. 1953, p. 328-337.

Heat treated steels possess a noticeable degree of hardness even at slight cold deformation. Hypotheses advanced to clarify causes of the phenomenon. Graphs, tables. 11 ref. (Q7, ST)

117-Q. (Russian.) Influence of Change of Deformation Rate on Plastic Stretching. L. I. Vasil'ev, A. S. Bylina and M. P. Zagrebennikova. *Doklady Akademii Nauk SSSR,* v. 90, no. 5, June 11, 1953, p. 767-769.

Importance of rate on continued deformation. Graphs. 3 ref. (Q24, Cu, Sn)

118-Q. (Russian.) **Resistance of Metals to Plastic Deformation.** Iu. I. Iagn and I. A. Chaplinskii. *Doklady Akademii Nauk SSSR,* v. 90, no. 6, June 21, 1953, p. 1023-1026.

Tests conducted on pure iron, steels and aluminum bronze. Graphs. 5 ref.
(Q24, Fe, CN, AY, Al)

119-Q. (Russian.) **Role of Grain Boundaries in the Process of Plastic Deformation of Aluminum.** E. S. Iakovleva and M. V. Iakutovich. *Doklady Akademii Nauk SSSR,* v. 90, no. 6, June 21, 1953, p. 1027-1029 + 1 plate.

Effects of changing conditions of deformation. Micrographs. 9 ref.
(Q24, Al)

120-Q. (Russian.) **Calculation of Strength of Jointed Eccentric Pipes and Conduits. Determination of Stresses in Jointed Pipes Caused by Press Fitting and Stresses in a Semi-plane With a Circular Hole.** N. D. Tarabasov. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 7, July, p. 949-963.

Formulae for component stresses. Diagrams, tables. 6 ref. (Q25)

121-Q. (Russian.) **Poisson's Ratio During Stress Relaxation.** B. M. Rovinskii and V. G. Liuttsau. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 10, Oct., p. 1471-1474.

Room temperature tests gave a value of 0.488 to 0.499 for aluminum and 0.416 to 0.493 for copper. Graphs, table. 3 ref. (Q21, Al, Cu)

122-Q. (Spanish.) **Application of Metallography to a Study on the Rupture of Tension-Test Specimens.** José Izaguirre Cobo. *Ciencia y técnica de la Soldadura,* v. 111, no. 14, Sept.-Oct. 1953, 8 p.

Influence of various chemical elements on mechanical properties of chromium-nickel stainless steel. Tension tests. Micrographs, diagrams (Q27, SS, Cr, Ni)

123-Q. Bauschinger Effect by Torsion of Copper Wires. M. J. Druyvesteyn and C. F. Etienne. *Applied Scientific Research,* v. 4, sec. A, no. 2, 1953, p. 100-104.

Influence of amount of deformation, temperature and preliminary stretching. Graphs. 5 ref.
(Q24, Cu)

124-Q. Some Aspects of the Effect of Copper in Cast Iron and Steel. June A. McNicol. *Australasian Engineer,* 1953, Oct., p. 54-60.

Precipitation hardening, tensile properties, creep strength and fatigue and corrosion resistance of copper-bearing iron and steel. 17 ref.
(Q23, Q7, Q3, R general, N7, CI, AY)

125-Q. WADC Evaluates Magnesium: Good, But—. Irving Stone. *Aviation Week,* v. 59, Dec. 28, 1953, p. 34-37.

Designers and producers must take into account the light metal's sensitivity to "incorrect" handling. Photographs. (Q general, Mg)

126-Q. Materials for High Temperature Service. III. Howard C. Cross. *Industrial Heating,* v. 20, Dec. 1953, p. 2416, 2418, 2420.

Properties of various metals, alloys, cermets and ceramic materials. Graph. (To be continued.)
(Q general, Al, Mg, Ti, SG-h, SS, Co, Mo, Ni)

127-Q. Effect of Plastic Deformation on Subsequent Decomposition in Aluminum Alloys. N. N. Buinov and L. I. Podrezov. *National Science Foundation Translation,* no. 41, Aug. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 665.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Electron-microscopic analysis of an aluminum-silver alloy shows that the decomposition in the surface layer of the alloy differed from that in the interior. Micrographs. 9 ref.
(Q24, Ag, Al)

128-Q. Internal Friction and Shear Modulus of Pure Copper and Beryllium Bronze. V. S. Postnikov. *National Science Foundation Translation,* no. 86, Sept. 1953, 4 p. (Original in *Doklady Akademii Nauk SSSR,* v. 91, no. 1, July 1953, p. 79-82.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Previously abstracted from original. See item 89-Q, 1954.
(Q22, Q2, Cu, Be)

129-Q. Jumplike Deformation in the Linear "Elastic" Range of the Strain Diagram. N. F. Syutkin. *National Science Foundation Translation,* no. 74, Sept. 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 83-85.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Jumplike deformation observed in a zinc-aluminum alloy during elastic extension. Test equipment is described. Graphs. 3 ref. (Q21, Al)

130-Q. Some Data on the Relation of Relaxation and Rate Characteristics in Plastic Deformation. L. I. Vasilyev. *National Science Foundation Translation,* no. 33, July 1953, 3 p. (Original in *Doklady Akademii Nauk SSSR,* v. 89, 1953, p. 451.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Tests made on wires of copper, nickel, copper-nickel alloy and tin. Graphs. 10 ref. (Q24, Cu, Ni, Sn)

131-Q. A Study of Isochromatic Lines in Transparent Models Under Finite Plastic Deformation. S. I. Gubkin and S. I. Dobrovolsky. *National Science Foundation Translation,* no. 83, 5 p. (Original in *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 799-802.) Available from Office of Technical Services, Department of Commerce, Washington 25, D. C. $0.10.

Pattern formed by the isochromatics determined by type of load, shape of the loaded body and apparatus employed. Micrographs. (Q24)

132-Q. Second-Order Elastic Deformation of Solids. D. S. Hughes and J. L. Kelly. *Physical Review,* v. 92, ser. 2, Dec. 1, 1953, p. 1145-1149.

Expressions for the velocities of elastic waves in stressed solids derived using Murnaghan's theory of finite deformations and third-order terms in the energy. Graphs, tables, diagrams. 14 ref. (Q21, Fe)

133-Q. (Hungarian.) **Present Status of the Testing of Iron Castings.** Tibor Lukacsfalvi., *Ontöde,* v. 4, no. 9, Sept., p. 196-201.

Necessity and usefulness of various tests, such as impact, fatigue limit, damping capacity and nondestructive. Diagrams, micrographs. 13 ref.

(Q6, Q7, Q8, S general, CI)

134-Q. (Book.) **Dislocations and Plastic Flow in Crystals.** A. H. Cottrell. 223 p. 1953. Oxford University Press, Amen House, Warwick Square, London E. C. 4, England, $5.00.

Includes chapters on interpretation of slip in crystals; elastic properties of dislocations; dislocations in crystals; theories of the yield strength; and work hardening, annealing and creep. (Q24)

135-Q. Fatigue of Metals. R. Cazaud. (Translated from French by A. J. Fenner.) 334 p. 1953. Philosophical Library, New York 16, N. Y. $12.50.

Comprehensive survey of behavior of metals under cyclic stresses. See also item 190-Q, 1953. Photographs, tables. (Q7)

136-Q. (Book.) **Stress Waves in Solids.** H. Kolsky. 211 p. 1953. Oxford University Press, Amen House, Warwick Square, London E. C. 4, England. $5.00.

Includes chapters on propagation in an extended elastic medium; propagation in bounded elastic media; experimental investigations with elastic materials; internal friction; experimental investigation of dynamic elastic properties; plastic waves and shock waves; and fractures produced by stress waves. (Q21, Q25)

137-Q. A Method of Making Edgewise Bend Tests of Rectangular Bus Bar. C. O. Smith and F. M. Howell. *ASTM Bulletin,* 1953, no. 194, p. 58-61.

Apparatus and techniques. Diagram, tables, photograph. (Q5)

138-Q. Fatigue Properties of Cast Iron. G. N. J. Gilbert. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Dec. 1953, p. 94-108.

General discussion including Orowan's theory of fatigue. Graphs, diagrams, tables. 12 ref. (Q7, CI)

139-Q. Comprehensive Mechanical Tests on an Acicular Cast Iron. K. B. Palmer. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Dec. 1953, p. 109-117 + 1 plate.

Results of tests on typical 30-ton tensile acicular cast iron carried out on reasonably uniform test pieces. Tables, graphs, micrographs. (Q general, CI)

140-Q. Galvanizing Embrittlement of Blackheart Malleable Iron. G. N. J. Gilbert. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Dec. 1953, p. 124-131 + 2 plates.

Effects of phosphorus and silicon on susceptibility to embrittlement. Quenching from 650° C. prevents embrittlement. Micrographs, drawing, graphs, tables. 5 ref. (Q23, L16, CI)

141-Q. The Problem of Hydrogen Diffusion in the Pickling of Spring Steel. J. S. Jackson. *Electrodepositors' Technical Society, Journal,* v. 28, 1951-1952, p. 89-98; disc., p. 98-101 + 2 plates.

It has been found that whereas hydrogen embrittlement only causes a slight reduction in fatigue limit, in cases of higher stress ranges results are very seriously lowered, especially in the case of hardened and tempered springs. Graphs, tables, diagram. 12 ref. (Q23, Q7, L12, CN)

142-Q. The Plastic Design of Grillages. Jacques Heyman. *Engineering,* v. 176, Dec. 25, 1953, p. 804-807.

Theoretical and experimental work in plastic behavior of grillages. Tables, photographs, diagrams, graphs. (Q23)

143-Q. The Low-Stress Torsional Creep Properties of Pure Aluminium.

W. Betteridge. *Institute of Metals, Journal,* v. 82, Dec. 1953, p. 149-161.

Creep properties of pure aluminum at 200° C. determined by a high-sensitivity torsion method, at a torque producing a maximum elastic shear strain of $2{\cdot}8 \times 10^{-5}$. Creep strain shown to be primarily dependent on amount of cold work applied to material and on time and temperature of annealing treatments given before the creep test. Tables, graphs, diagram. 21 ref. (Q3, Al)

144-Q. The Effects of Some Constitutional Factors on the Creep and Fatigue Properties of Lead and Lead Alloys. L. M. T. Hopkin and C. J. Thwaites. *Institute of Metals, Journal,* v. 82, Dec. 1953, p. 181-196 + 7 plates.

Tin, copper and antimony were added to high-purity lead. Fine grains and presence of dispersed phases increased creep resistance. Fatigue resistance was increased more in single-phase alloys than in two-phase systems. Aging effects studied. Graphs, tables. 53 ref. (Q3, Q7, Pb)

145-Q. Fracture of Alpha Iron. Constance F. Tipper and E. O. Hall. *Iron & Steel,* v. 26, Dec. 11, 1953, p. 594-597; disc., p. 659-662.

Abridged from paper presented at Iron and Steel Institute, Autumn General Meeting, 1953. Investigation to determine amount of plastic deformation involved in fracture of crystals when such fracture was of cleavage type. Diagrams, graphs, table, micrographs. (Q24, Q26, Fe)

146-Q. Iron-Oxygen Alloys. W. P. Rees and B. E. Hopkins. *Iron & Steel,* v. 26, Dec. 11, 1953, p. 597-600; disc., p. 659-662.

Abridged from paper presented at Iron and Steel Institute, Autumn General Meeting, 1953. Tensile and V-notched Charpy impact tests over temperature range covering tough to brittle transition. Table, micrographs. (Q6, Q27, Fe)

147-Q. Propagation of Brittle Fracture in Steel. T. S. Robertson. *Iron and Steel Institute, Journal,* v. 175, Dec. 1953, p. 361-374 + 4 plates.

Development of a new test which applies a known transverse stress and assesses material through its ability to arrest a running crack. Diagrams, graphs, tables. (Q26, Q23, ST)

148-Q. Internal Friction of Molybdenum During Tensile Deformation. R. E. Maringer. *Journal of Applied Physics,* v. 24, Dec. 1953, p. 1525.

Results of experimental study. Graph. (Q22, Mo)

149-Q. Mechanical Properties of Zirconium. *Light Metal Age,* v. 11, Dec. 1953, p. 16-18.

Results of tests. Annealing, deforming, welding and casting of unalloyed zirconium. Tables. (Q general, Zr)

150-Q. Thick Cylinders. W. A. Milnes. *Mechanical World and Engineering Record,* v. 133, Dec. 1953, p. 540-543.

Complement to traditional method of establishing basic Lamé equations for radial and hoop stresses in thick cylinders subjected to heavy hydrostatic pressure. Applications to derivation of practical formulas for wall thickness and design stress recommendations. Diagrams. (Q25)

151-Q. Research Progress. Kink Bands. *Metal Industry,* v. 83, Dec. 11, 1953, p. 481.

Slip and deformation of face-centered cubic metal crystals. 3 ref. (Q24, Al, Cu)

152-Q. Intercrystalline Brittleness. A. R. Bailey, S. Morris, and A. J. K. Wiesiolek. *Metal Industry,* v. 83, Dec. 18, 1953, p. 497-498.

Investigates delayed intercrystalline failure under sustained tensile stress, in air, of sand-cast, ternary beta brass containing about 4% aluminum. Table. 8 ref. (Q23, Cu)

153-Q. A Note on the Preparation of Miniature Tensile Test Specimens. R. J. M. Payne. *Metallurgia,* v. 48, no. 290, Dec. 1953, p. 315.

Method of sampling large components in order to investigate local properties. Diagram. (Q27)

154-Q. Influence of Microstructure on the Hot Strength of Steel. Georges Delbart and Michel Ravery. *Metal Treatment and Drop Forging,* v. 20, Dec. 1953, p. 579-589.

Creep tests were carried out at 450 and 575° C. Influence of preliminary heating and soaking investigated. Tables, graphs, micrographs. 5 ref. (Q3, M27, AY)

155-Q. Stress-Strain Records at High Straining Rates. Francis G. Tatnall and Greer Ellis. *Nondestructive Testing,* v. 11, Nov.-Dec. 1953, p. 32-34.

Trials of suggested instrumentation for recording X-Y load-deformation curves of structural parts and components subjected to pulses, shocks, impacts, vibrations and alternating loads at frequencies encountered in service. Diagrams, photographs, oscillograms. (Q27)

156-Q. Plastic Deformation and the Electric Strength of Alkali Halide Crystals. R. Cooper and A. A. Wallace. *Physical Society, Proceedings,* v. 66, no. 408B, Dec. 1953, p. 1113-1115.

Photo-elastic method used to detect birefringence due to plastic de-

formation. Apparatus illustrated. Micrographs, diagram. 4 ref. (Q24, Q25)

157-Q. Electrolytic Cold-Working and Internal Friction in Palladium-Hydrogen Alloys. F. A. Lewis, G. E. Roberts and A. R. Ubbelohde. *Royal Society, Proceedings,* v. 220, ser. A, Dec. 8, 1953, p. 279-289.

Effects of hydrogen on elastic moduli of palladium are only small. Graphs, photograph, diagrams. 18 ref. (Q22, Pb)

158-Q. Internal Friction in Metals. A. S. Nowick. Paper from "Progress in Metal Physics". v. IV. Interscience Publishers, Inc., p. 1-70.

Attempt to provide a phenomenological description of general features of nonelastic deformation which is sufficiently general to include anelasticity, static hysteresis and amplitude dependent internal friction. Graphs, diagrams. 149 ref. (Q22)

159-Q. Theory of Dislocations. A. H. Cottrell. Paper from "Progress in Metal Physics". v. IV. Interscience Publishers, Inc., p. 205-264 + 2 plates.

Review of progress. Diagrams, graphs. 160 ref. (Q24, M26)

160-Q. The Statistical Behavior of Fatigue Properties and the Influence of Metallurgical Factors. E. Epremian and R. F. Mehl. Paper from "Symposium on Fatigue With Emphasis on Statistical Approach". II. ASTM Special Technical Publication no. 137. American Society for Testing Materials, p. 25-54; disc., p. 55-57.

Includes tables, graphs, diagrams. 23 ref. (Q7)

161-Q. A Statistical Interpretation of the Effect of Understressing on Fatigue Strength. E. Epremian and R. F. Mehl. Paper from "Symposium on Fatigue with Emphasis on Statistical Approach". II. ASTM Special Technical Publication no. 137. American Society for Testing Materials, p. 58-64; disc., p. 65-69.

Investigation to study understressing effect from a statistical viewpoint. Tables, graphs. (Q7)

162-Q. Fatigue Properties of Large Specimens With Related Size and Statistical Effects. Oscar J. Horger and Harry R. Neifert. Paper from "Symposium on Fatigue with Emphasis on Statistical Approach". II. ASTM Special Technical Publication no. 137. American Society for Testing Materials, p. 70-89; disc., p. 90-91.

Results of rotating-bending fatigue tests on shafts 0.3 to 6 in. in diameter from ASE plain carbon steels of 0.39 and 0.54% carbon content in both the as-forge and normalized-and-tempered conditions. Shafts were tested with stress concentration, as represented by both fillets and press-fitted members, as well as plain specimens. Diagrams, micrographs, tables, photograph. 14 ref. (Q7, ST)

163-Q. Mechanism of Action of Inhibitors Upon Hydrogen Embrittlement of Steel in Sulfuric Acid. Z. A. Iofa and E. I. Liakhovetskaia. Henry Brutcher, Altadena, Cal., Translation no. 3048, 9 p. (From *Doklady Akademii Nauk SSSR,* v. 86, no. 3, 1952, p. 577-580.)

Previously abstracted from original. See item 92-Q, 1954. (Q23, Q5, CN)

164-Q. (English.) **Auto-Stresses in Steel Parts.** *Aciers Fins & Spéciaux Francais,* 1953, no. 15, Nov., p. 32-36.

Production, measurement, effects, stress relief and suppression of autostresses. 4 ref. (Q25, ST)

165-Q. (French.) **The Effect of Low Temperatures on Plasticity of Steels Used in Metallic Constructions.** A. Chagneau. *Ossature metallique,* v. 18, no. 11, Nov. 1953, p. 577-580.

Changes in mechanical properties of metals and alloys in tension, drop, fatigue, hardness and impact tests. Outlines MacAdam theory to explain influence of low temperatures. Graphs. (Q general, ST)

166-Q. (French.) **Definition of Fatigue Resistance in the Case of Steel-Welded Structures.** *Soudure et Techniques connexes,* v. 7, nos. 11-12, Nov.-Dec. 1953, p. 282-284.

Results of tests conducted by the International Welding Institute's Fatigue Testing Commission no. 13. Photographs. (Q7, K9, ST)

167-Q. (German.) **Hardness Testing of Cast-Copper Alloys. I.** P. Melchior. **II.** H. Meichsner. *Metall,* v. 7, nos. 11-12, June 1953, p. 433-436; nos. 23-24, Dec. 1953, p. 1007-1009.

Part I: Three seconds are adequate for loading interval in Brinell hardness test. Part II: Experimental data showing that proposed reduction of impression time is neither necessary nor desirable. Tables, graphs, micrographs. (Q29, Cu)

168-Q. (German.) **Symposium on Brittle Fracture in Leoben.** O. Werner. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 901-905.

Phenomena, mechanism, causes and structural processes of brittle fracture. Methods of testing. 11 ref. (Q26, Q23)

169-Q. (German.) **Explanation of the Supporting Effect in Alternating**

Stress. H. O. Meuth. *Metall,* v. 7, nos. 23-24, Dec. 1953, p. 974-977.

Effect of a notch on alternating and statistically stressed materials. Diagrams, graphs. 24 ref. (Q25)

170-Q. (German.) **Formation of Slip Lines on Plastically Deformed Metal Surfaces. II-III.** W. Späth. *Metalloberfläche,* Ausgabe A, v. 7, no. 12, Dec. 1953, p. 177-183.

Literature review on slip lines and bands. Mechanism of slipping was shown to generate ultrasound waves. Effect of temperature on slip band width. Correlation between slip band width and ultrasonic frequencies of different metals. Diagrams, tables. 34 ref. (Q24)

171-Q. (German.) **X-Ray Investigation on the Internal Stresses in Plastically Elongated Iron.** Eugen Kappler and Ludwig Reimer. *Zeitschrift für angewandte Physik,* v. 5, no. 11, Nov. 1953, p. 401-406.

Grunough's theory expanded by applying obliquely incident X-rays. Results confirm theory. Stress-lattice constant diagrams explain high internal stresses of iron. Graphs. 14 ref. (Q25, Fe)

172-Q. (Russian.) **Questions of Conformity in Relaxation and Speed Characteristics During Plastic Extension.** L. I. Vasil'ev. *Doklady Akademii Nauk SSSR,* v. 92, no. 2, Sept. 11, 1953, p. 301-302.

New data correlates theory and experimental results using specimens of tin, copper, nickel and copper-nickel wire. (Q23, Sn, Cu, Ni)

173-Q. (Russian.) **Wear Resistance of Diffusion Chromium Plated Carbon Steel in the Presence of Certain Liquid Media.** M. M. Khrushchov, M. A. Babichev and G. N. Dubinin. *Doklady Akademii Nauk SSSR,* v. 92, no. 2, Sept. 11, 1953, p. 303-306.

Investigations made in 5% K_2CrO_4 solution in distilled water. Wear resistance is not determined by hardness of steel. Tables, graphs. 4 ref. (Q9, CN, Cr)

174-Q. (Russian.) **Plastic Deformation and Fracture During Torsion.** F. P. Rybalko. *Doklady Akademii Nauk SSSR,* v. 93, no. 3, Nov. 21, 1953, p. 471-473.

Investigations devoted to study of the connection between plasticity of metals and appearance of macro-evidence of deformation. Graph. 7 ref. (Q24, Q1)

175-Q. (Russian.) **Mechanical Properties of Basic Open Hearth Carbon Steel.** S. L. Levin, S. N. Mylko and I. P. Kazachkov. *Liteinoe Proizvodstvo,* 1953, no. 8, Aug., p. 1-4.

Factors influencing formation of hot cracks in castings. Techniques of melting and effect of carbon content and pouring temperature. Tables, graphs. 6 ref.
(Q general, D2, CI)

176-Q. (Russian.) **Durability of High Phosphorus Perlitic Cast Iron.** V. B. Liadskii. *Liteinoe Proizvodstvo,* 1953, no. 8, Aug., p. 16-17.

Results of laboratory wear tests. Sliding and rolling friction resistance determined. Tables, diagrams. 9 ref. (Q9, CI)

177-Q. (Russian.) **Complex Stress Functions in the Axisymmetrical Contact Problem in the Elasticity Theory.** N. A. Rostovtsev. *Prikladnaia Matematika i Mekhanika,* v. 17, no. 5, Sept.-Oct. 1953, p. 611-614.

Method of calculation of stress and displacement fields in absence of friction and adhesive forces. 4 ref. (Q21)

178-Q. (Russian.) **Calculation of the Profile of a Rotating Disk for Creep Conditions.** A. G. Kostiuk. *Prikladnaia Matematika i Mekhanika,* v. 17, no. 5, Sept.-Oct. 1953, p. 615-618.

Considers thin disk with stationary creep conditions. 3 ref. (Q3)

179-Q. (Swedish.) **Impact Transition Temperatures and Aging Properties of Titanium Stabilized Mild Steels.** Ake Josefsson and Bengt Nelson. *Jernkontorets Annaler,* v. 137, no. 10, 1953, p. 725-743.

Influence of fixing carbon and nitrogen as soluble titanium carbides and nitrides on transition temperature in the Charpy test. Graphs, micrographs, tables. 13 ref.
(Q6, N7, ST, Ti)

180-Q. The Statistical Nature of the Fatigue Properties of SAE 4340 Steel Forgings. J. T. Ransom and R. F. Mehl. Paper from "Symposium on Fatigue with Emphasis on Statistical Approach". II. ASTM Special Technical Publication no. 137. American Society for Testing Materials, p. 3-21; disc., p. 21-24.

High and low-quality forgings of same tensile strength level studied. Specimens taken in longitudinal and transverse directions. Procedures used to permit statistical analysis of variability of endurance limit and life to failure. Tables, diagrams, graphs. 15 ref. (Q7, ST)

181-Q. Steel Testing and Design. III. W. A. Martin. *Canadian Metals,* v. 17, Jan. 1954, p. 34-35.

Testing and design procedures with sound engineering bases are necessary to reduce ignorance factors in design and to assist in avoiding material failures under service conditions. Low-alloy high-tensile steels are discussed. 3 ref.
(Q general, AY)

182-Q. Effect of Plastic Deformation on Carbide Precipitation in Steels. D. V. Wilson. *Iron and Steel Institute, Journal,* v. 176, Jan. 1954, p. 28.

Tests show that carbide precipitation is strongly retarded by plastic deformation in medium carbon steels. Micrographs. 4 ref. (Q24, N8, ST)

183-Q. Tin Increases Strength of Ti-Al Alloys Without Loss in Fabricability. W. L. Finlay, R. I. Jaffee, R. W. Parcel and R. C. Durstein. *Journal of Metals,* v. 6, Jan. 1954, p. 25-29.

Experimental data show 5% aluminum, 2.5% tin alloy is markedly superior to interstitial alpha-type alloys. Graphs, tables. 5 ref. (Q general, Ti, Al, Sn)

184-Q. Effect of Repeated Tensile Prestrain on the Ductility of Some Metals. Edmund C. Franz. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Jan. 1954, p. 56-57.

Techniques and results of experiments using aluminum alloy and electrolytic copper. Graphs, micrograph. 4 ref. (Q23, Al, Cu)

185-Q. Mechanism of Plastic Flow in Titanium: Manifestations and Dynamics of Glide. F. D. Rosi. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Jan. 1954, p. 58-69.

Slip and twinning behavior in extended titanium crystals are studied in some detail. Formation and appearance of coarse kink bands. Diagrams, micrographs, table. 29 ref. (Q24, Ti)

186-Q. Creep Correlations of Metals at Elevated Temperatures. Oleg D. Sherby, Raymond L. Orr and John E. Dorn. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Jan. 1954, p. 71-80.

Application of correlations to data for aluminum, iron, nickel, copper, zinc, platinum, gold, lead, and simple alloys. Graphs, tables. 22 ref. (Q3, Al, Fe, Ni, Cu, Zn, Pt, Au, Pb)

187-Q. On the Axisymmetric Problem of Elasticity Theory for a Medium With Transverse Isotropy. R. A. Eubanks and E. Sternberg. *Journal of Rational Mechanics and Analysis,* v. 3, Jan. 1954, p. 89-101.

Mathematical discussion. 12 ref. (Q21)

188-Q. Cantilever Beams. B. Saelman. *Machine Design,* v. 26, Jan. 1954, p. 161-163.

Method of calculating tearout strength. Diagrams, graphs. (Q23)

189-Q. Properties of Cast Stainless Steels. *Materials & Methods,* v. 39, Jan. 1954, p. 129, 131, 133.

Data sheet. (Q general, SS)

190-Q. Brittle Failure of Nonship Steel-Plate Structures. M. E. Shank. *Mechanical Engineering,* v. 76, Jan. 1954, p. 23-28.

Summary of report to the Committee on Ship Structural Design, National Academy of Science—National Research Council. A survey of nonship brittle failures of carbon plate steel structure to determine factors relating to such failures. Photographs. (Q23)

191-Q. Viscous Flow at Grain Boundaries? *Metal Industry,* v. 84, Jan. 8, 1954, p. 30.

Theories of mechanism of creep in a polycrystalline metal. 1 ref. (Q3, Al)

192-Q. Comparative Fatigue Tests With 24S-T Alclad Riveted and Bonded Stiffened Panels. J. H. Rondeel, R. Kruithof and F. J. Plantema. *Netherlands Nationaal Luchtvaartlaboratorium Report* S. 416, Dec. 1952, p. S1-S14.

Compares fatigue strengths of bonded and riveted flat sheet-stringer panels of identical construction except for the sheet-stringer joints. Results of fatigue tests on panels stiffened with angle section stringers and top-hat stringers. Graphs, diagrams, tables, photographs. (Q7, K13, Al)

193-Q. Note on the General Stress-Strain Relations of Some Ideal Bodies Showing the Phenomena of Creep and of Relaxation. J. P. Benthem. *Netherlands Nationaal Luchtvaartlaboratorium Report* S. 426, p. S15-S23.

General stress-strain relations of isotropic linear bodies and viscosity phenomena which may accompany plastic deformation. Diagrams. 7 ref. (Q23, Q24, Q3)

194-Q. Deformation in Copper and Alpha Brasses. A. M. Halstead, J. M. McCaughey and H. Markus. *Product Engineering,* v. 25, Jan. 1954, p. 180-185.

Clarification of true nature of stress-strain relationship and cause of initial deformation. Tables, photographs, graphs. 9 ref. (Q27)

195-Q. Lower and Upper Bounds to the Ultimate Loads of Buckled Redundant Trusses. E. F. Masur. *Quarterly of Applied Mathematics,* v. 11, Jan. 1954, p. 385-392.

Two theorems are derived establishing lower and upper bounds to ultimate loads. 8 ref. (Q28)

196-Q. On Saint-Venant's Principle. E. Sternberg. *Quarterly of Applied*

Mathematics, v. 11, Jan. 1954, p. 393-402.
Mathematical discussion of principle which involves the problem of extension, torsion, and flexure of prismatic and cylindrical bodies. 18 ref. (Q27, Q1)

197-Q. Plastic Flow in a Deeply Notched Bar With Semi-Circular Root. Alexander J. Wang. *Quarterly of Applied Mathematics,* v. 11, Jan. 1954, p. 427-438.
Unsteady motion problem of a circular-notched bar pulled in tension in plane strain. Graphs. 7 ref. (Q24)

198-Q. On Some Eigenvalue Problems of Exceptional Difficulty, Exemplified by a Case of Elastic Instability. R. V. Southwell and Gillian Vaisey. *Quarterly Journal of Mechanics and Applied Mathematics,* v. 6, Dec. 1953, p. 453-480.
Relaxation methods to estimate critical load and mode of distortion ("waving") for a flat plate representative of a cantilever I-beam. Diagrams, graphs, tables. 14 ref. (Q21)

199-Q. Closure Waves in Helical Compression Springs With Inelastic Coil Impact. J. A. Morrison. *Quarterly of Applied Mathematics,* v. 11, Jan. 1954, p. 457-471.
Problem of spring surges taking into account coil closure is mathematically discussed. Drawings. 1 ref. (Q28)

200-Q. The Torsion and Stretching of Spiral Rods. II. H. Okubo. *Quarterly of Applied Mathematics,* v. 11, Jan. 1954, p. 488-495.
A mathematical analysis. Graphs. (Q1)

201-Q. An Addition to Poritsky's Solutions of a Differential Equation of Torsion. J. C. Wilhoit, Jr. *Quarterly of Applied Mathematics,* v. 11, Jan. 1954, p. 499-501.
Mathematical solutions. 1 ref. (Q1)

202-Q. Problems of Hardness Testing of Thin Sheet Metals. E. Börje Bergsman. *Sheet Metal Industries,* v. 31, no. 321, Jan. 1954, p. 5-14.
Micro-hardness and problems arising from testing sheet and foil. Graphs, photomicrographs, table. 37 ref. (Q29)

203-Q. Hardness Testing Equipment and Methods. John E. Hyler. *Tooling and Production,* v. 19, Dec. 1953, p. 64, 75, 78, 104-108.
Includes photographs. (Q29)

204-Q. Fatigue Tests at Stresses Producing Failure in 2 to 10,000 Cycles. 24S-T3 and 75S-T6 Aluminum-Alloy Sheet Specimens With a Theoretical Stress-Concentration Factor of 4.0 Subjected to Completely Reversed Axial Load. Herbert F. Hardrath and Walter Illg. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3132, Jan. 1954, 14 p.
Notched specimens were subjected to completely reversed axial loads. Failures occurred in less than 50 cycles at two-thirds of static tensile strength and in as few as two cycles when applied load was near the static strength of the specimen. Graphs, tables, photograph. 7 ref. (Q7)

205-Q. Ductility Transition of Weld Metal. W. S. Pellini and E. W. Eschbacher. *Welding Journal,* v. 33, Jan. 1954, p. 16S-20S.
Determination by drop weight test method. Relative resistance to fracture initiation of weld metal and structural steels. Photographs, diagrams, tables, graphs. 4 ref. (Q23, ST)

206-Q. Fatigue Strength of Butt Joints in ⅜-in. Thick Aluminum Alloy Plates. E. C. Hartmann, Marshall Holt and I. D. Eaton. *Welding Journal,* v. 33, Jan. 1954, p. 21S-30S.
Results of direct-stress fatigue tests. Tables, diagrams, photographs, graphs. 8 ref. (Q7, Al)

207-Q. The Plastic Fatigue Strength of Pressure Vessel Steels. J. H. Gross, D. E. Gucer and R. D. Stout. *Welding Journal,* v. 33, Jan. 1954, p. 31S-39S.
Strain behavior, surface preparation, testing temperature, welding, and heat treatments. Diagrams, photographs, graphs, tables. 2 ref. (Q7, CN, AY)

208-Q. (English.) **Some Plastic Properties of Nickel Alloys.** V. F. Zackay and T. H. Hazlett. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 624-628.
Data on nickel-iron alloys show that iron effectively solution-hardens nickel. Tables, graphs. 5 ref. (Q23, N7, Fe, Ni)

209-Q. (English.) **Tensile Deformation of High-Purity Copper as a Function of Temperature, Strain Rate, and Grain Size.** R. P. Carreker, Jr., and W. R. Hibbard, Jr. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 654-655, 657-663.
Effect of rate was investigated by rate-change tests over the same ranges of temperature and grain size. Graphs, tables, diagram. 21 ref. (Q27, Cu)

210-Q. (English.) **Cleavage Deformation in Zinc and Sodium Chloride.** P. L. Pratt. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 692-699.
Flat surfaces prepared by cleavage of single crystals show deforma-

tion markings associated with propagation of the cleavage crack. Micrographs, diagrams. 11 ref. (Q24, Zn)

211-Q. (English.) **Deformation Mechanisms in Titanium at Elevated Temperatures.** C. J. McHargue and J. P. Hammond. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 700-701, 703-705.
Study of coarse-grained specimens deformed in tension at 815° C. Diagrams, micrographs, table. 9 ref. (Q27, Ti)

212-Q. (English.) **The Dynamic Yielding of Mild Steel.** J. D. Campbell. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 706-710.
Results of dynamic and impact tests on mild steel. A criterion for dynamic yield is proposed. Graphs. 15 ref. (Q27, Q6, CN)

213-Q. (English.) **The Nucleation Problem in Deformation Twinning.** R. L. Bell and R. W. Cahn. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 752-753.
Discusses three characteristics in twinning; creation of wedge-shaped twin, spread of twin across crystal, and thickening of twin lamella. 9 ref. (Q24, Zn)

214-Q. (English.) **Strain Markings in Alpha-Brass.** J. J. Gilman. *Acta Metallurgica,* v. 1, no. 6, Nov. 1953, p. 764.
Accounts for appearance of strain markings upon etching. 2 ref. (Q24, Cu)

215-Q. (French.) **Effect of Rate of Deformation and Temperature on the Work Hardening of Armco Iron.** H. Hendus and H. Röhrig. *Revue de métallurgie,* v. 50, no. 12, Dec. 1953, p. 833-838; disc., p. 838.
Microtensile tests were carried out at various temperatures between 20 and 100° C. Graphs. 11 ref. (Q27, Fe)

216-Q. (French.) **Effect of Aging at 80° C. on Mechanical Properties of Armco Iron and a 0.16% Carbon Steel.** H. Hendus and H. Röhrig. *Revue de métallurgie,* v. 50, no. 12, Dec. 1953, p. 839-843.
Effect of aging on hardness, elastic limit, tensile strength, and work-hardening. Graphs. 12 ref. (Q general, N7, AY)

217-Q. (German.) **Hot Work Toolsteels.** Hermann M. Hiller. *Stahl und Eisen,* v. 73, no. 24, Nov. 19, 1953, p. 1565-1574.
Required properties of toolsteels and methods of determining these properties. Effects of different alloying elements and application of heat resistant toolsteels. Table, graphs. 29 ref. (Q general, T6, TS)

218-Q. (German.) **Experiments on the Development of a Wear Resistant Medium-Hard Cast Iron Roll With Spheroidal Cast Iron.** Wilhelm Schlüter. *Stahl und Eisen,* v. 73, no. 24, Nov. 19, 1953, p. 1605-1607.
Structure and mechanical properties due to spheroidal graphite in cast iron. Tables, graph, diagrams. (Q general, CI)

219-Q. (German.) **High-Strength Weldable Heavy Structural Steel With Aluminum and Titanium Additions.** Roland Mitsche and Alois Legat. *Stahl und Eisen,* v. 73, no. 25, Dec. 3, 1953, p. 1652-1654.
Laboratory and plant experience has shown that low-alloy manganese steels were greatly improved in strength. Graphs, tables. 20 ref. (Q23, AY)

220-Q. (Polish.) **X-Ray Investigations of Low-Carbon Steel Textures.** Z. Bojarski. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 5, Sept.-Oct. 1953, p. 285-290.
Literature review on textures produced by rolling and recrystallization of iron and low-carbon steel. Tables, photograph, X-ray diffraction patterns. 22 ref. (Q24, CN, Fe)

221-Q. (Russian.) **Certain Characteristics of Variable Rate of Plastic Elongation.** L. I. Vasil'ev and L. I. Eremina. *Doklady Akademii Nauk SSSR,* v. 93, no. 6, Dec. 21, 1953, p. 1019-1020.
Compares results of experiments using aluminum specimens with previous tests using copper and tin. Graph. 3 ref. (Q24, Sn, Al, Cu)

222-Q. (Russian.) **Determining the Coefficient of Diffusion During Plastic Deformation.** S. I. Gubkin and S. A. Dovnar. *Doklady Akademii Nauk SSSR,* v. 93, no. 6, Dec. 21, 1953, p. 1025-1027.
Method does not require vacuum installations and is simpler than others. Data are precise and easily processed. Diagrams. (Q24, Ni)

223-Q. **Plastic Theory for a Trussed Steel Beam With a Central Load.** R. W. Steed. *Engineering,* v. 177, Jan. 15, 1954, p. 77-78.
Basic principles of plastic theory for specialized structures. (Q23, ST)

224-Q. **The Behaviour of Thick-Walled Cylinders Under Very High Pressures.** L. Deffet and J. Gelbgras. *Engineers' Digest,* v. 15, Jan. 1954, p. 17-19. (Translated from *Revue Universelle des Mines,* ser. 9, v. 9, no. 10, Oct. 1953, p. 725-740.)
Previously abstracted from original. See item 10-Q, 1954. (Q25, CN)

225-Q. On the Effect of Pretwisting on Bending. Francis D. Murnaghan. *National Academy of Sciences of the United States of America, Proceedings,* v. 39, Dec. 1953, p. 1218-1220.

In a solid circular beam, to obtain the sum of the deflections due to torsion and bending separately, there must be superimposed on the twisting and bending moments a transverse loading. (Q5, Q1)

226-Q. The Effect of Static and Dynamic Loading and Temperature on the Yield Stress of Iron and Mild Steel in Compression. J. M. Krafft, A. M. Sullivan and C. F. Tipper. *Royal Society, Proceedings,* v. 221, ser. A, Jan. 7, 1954, p. 114-127 + 2 plates.

Cylindrical test samples were compressed statically and dynamically at temperatures ranging from +100° to −195° C. Yield stress, form of yield and surface markings were observed. Diagrams, micrographs, graphs. 8 ref. (Q28, Fe, CN)

227-Q. The Propagation of Electrons in a Strained Metallic Lattice. S. C. Hunter and F. R. N. Nabarro. *Royal Society, Proceedings,* v. 220, ser. A, Dec. 22, 1953, p. 542-561.

Propagation of electrons in a strained metallic medium studied by a technique in which perturbing potenial is proportional to elastic strain. Electrical resistivity caused by dislocations is calculated for copper and sodium. Graph. 17 ref. (Q25, P15, Cu, Na)

228-Q. Elastic Buckling Under Combined Stresses of Flat Plates With Integral Waffle-Like Stiffening. Norris F. Dow, L. Ross Levin and John L. Troutman. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3059, Jan. 1954, 19 p.

Theory and experiment compared and found in good agreement. Graphs, photographs, table, diagram. 13 ref. (Q28, Al)

229-Q. Data on the Compressive Strength of Skin-Stringer Panels of Various Materials. Norris F. Dow, William A. Hickman and B. Walter Rosen. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3064, Jan. 1954, 49 p.

Flat skin-stringer compression panels of stainless steel, mild steel, titanium. copper, four aluminium alloys and a magnesium alloy were tested. Graphs, photograph, diagram, tables. 19 ref. (Q28, SS, ST, Ti, Cu, Al, Mg)

230-Q. Creep Bending and Buckling of Linearly Viscoelastic Columns. Joseph Kempner. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3136, Jan. 1954, 22 p.

General dynamic equation of creep bending of a beam loaded laterally and axially derived for a linearly visco-elastic material whose mechanical properties can be characterized by four parameters. Graphs, diagrams. 10 ref. (Q3, Q28)

231-Q. Creep Bending and Buckling of Nonlinearly Viscoelastic Columns. Joseph Kempner. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3137, Jan. 1954, 27 p.

Differential equations of bending of an idealized H-section beam column derived for a nonlinearly viscoelastic material whose mechanical properties are analogous to a model consisting of a linear spring in series with a nonlinear dashpot whose strain rate is proportional to a power of the applied stress. Graphs, diagrams, tables. 11 ref. (Q3, Q28)

232-Q. Creep Buckling of Columns. Joseph Kempner and Sharad A. Patel. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3138, Jan. 1954, 24 p.

Formulas for determination of creep deflection-time characteristics of an initially curved idealized H-section column. Graphs, diagrams, tables. 5 ref. (Q28, Q3)

233-Q. Time-Dependent Buckling of a Uniformly Heated Column. Nathan Ness. *U. S. National Advisory Committee for Aeronautics, Technical Note,* 3139, Jan. 1954, 18 p.

Theoretical investigation of time-temperature-dependent buckling of a pin-jointed constant-section column whose initial curvature is defined by a half-sine wave when material is linearly visco-elastic and is heated uniformly along the column at a prescribed time rate. Graph, diagram. 9 ref. (Q28)

234-Q. "Grass Roots" of Stress Control. Joseph Holt. *Welding Engineer,* v. 39, Feb. 1954, p. 50-53.

Importance of thorough understanding of stress control, shrinkage and distortion to avoid residual stress and gain greater strength and longer life for our ships and weldments. Photographs. (Q25, K general)

235-Q. Procedure for Determining the Hardness Variation Pattern of Alpha and Gamma Phases in Steel Being Heated in Vacuo to 2000° F. M. G. Lozinskii. Henry Brutcher, Altadena, Cal., Translation no. 3045, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 84, no. 1, 1952, p. 63-66.)

Previously abstracted from the original. See item 726-Q, 1952. (Q29, CN)

236-Q. Abrasive Wear of Metals at Various Temperatures and Speeds. G. I. Kiselev. Henry Brutcher, Altadena, Cal., Translation no. 3062, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 87, no. 5, 1952, p. 735-737.)

Previously abstracted from original. See item 778-Q, 1953.
(Q9, CN, Cu, Zn)

237-Q. (French.) **Definition of Fatigue Strength in Welded Steel Structures.** *Revue de la Soudure (Brussels),* v. 9, no. 4, 1953, p. 184-186.

Criterion of fatigue strength adopted by International Institute of Welding for steels is maximum load the material will withstand for two million cycles. Photographs.
(Q7, ST)

238-Q. (French.) **Some Experimental Data Concerning the Schnadt Resilience Tests.** R. Vancrombrugge. *Revue de la Soudure (Brussels),* v. 9, no. 4, 1953, p. 207-213.

Results of tests depending on gradient of stress, velocity of deformation and nature of stress. Photographs, tables, graphs. (Q25, K9)

239-Q. An Investigation Into the Plastic Bending of Aluminium Alloy Beams. J. B. Dwight. Aluminium Development Association, Research Report no. 16, 1953, 68 p.

Investigations into flexural behavior of aluminum beams, with the object of providing information for any subsequent development of a plastic design method for aluminum structures. Diagrams, graphs, photographs, tables. 20 ref. (Q23, Al)

240-Q. (Photocopy.) **A Study of Creep of Titanium and Two of Its Alloys.** PB112228. Univ. of Michigan for U. S. Air Force. 26 p. Sept. 1951. Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00. Photostat $3.75.

On basis of data obtained by reheating at 210, 400, and 600° F., for various lengths of time, conclusions are reached on creep rates, hardness values, and yield strengths in relation to the time at recovery temperature. All tests are explained and illustrated in graphical forms.
(Q3, Ti)

241-Q. (Book.) **ASME Handbook. Metals Engineering—Design.** Oscar J. Horger, Ed. 405 p. 1953. McGraw-Hill Book Co. Inc., 330 W. 42nd St., New York 36, N. Y. $10.00.

A summary of important reference data and essential properties to be considered in design. (Q general)

242-Q. (Book.) **Applied Elasticity.** Chi-Teh Wang. 357 p. 1953. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $8.00.

Chapters on analysis of stress and strain; stress-strain relations and the general equations of elasticity; plane-stress and plane-strain problems; torsion of various shaped bars; finite-difference approximations and the relaxation method; energy principles and variational methods; solution by means of complex variables; bending and compression of bars; numerical method in determination of buckling loads; bending and buckling of thin plates; and theory of thin shells and curved plates.
(Q21)

243-Q. (Book.) **Design in Structural Steel.** John E. Lothers. 454 p. Prentice-Hall, 70 Fifth Ave., New York 11. $10.00

Makes use of latest building and bridge specifications, and demonstrates most recent methods of analysis and design. (Q25, T26, ST)

244-Q. (Book.) **Formulas for Stress and Strain.** Raymond J. Roark. 3rd Ed. 381 p. 1954. McGraw-Hill Book Co., 330 W. 42nd St., New York 36.

Intended primarily as a reference book. A compact summary of the formulas, facts, and principles pertaining to strength of materials.
(Q23)

245-Q. Heat Treatment, Structure, and Mechanical Properties of Ti-Mn Alloys. F. C. Holden, H. R. Ogden and R. I. Jaffee. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 169-184.

Study of factors affecting mechanical properties of beta-stabilized titanium alloys. Principal compositional factors have been found to be solid-solution strengthening, martensitic transformation and instability of beta phase. Structural factors, such as grain size and shape, were found to have more influence on ductility and toughness than on strength. Graphs, micrographs, tables, photographs. 4 ref.
(Q general, J27, M27, Ti, Mn)

246-Q. The Structure of Surfaces and the Mechanism of Friction. J. W. Menter. *Birmingham Metallurgical Society, Journal,* v. 33, Sept. 1953, p. 97-118.

Experimental work which contributed to theories presented. Micrographs, graphs, tables, diagrams.
(Q9, M28)

247-Q. Scatter of Results of Creep-Rupture Tests on Heat-Resisting Steels. H. Zschokke. *Brown Boveri Review,* v. 40, nos. 5-6, May-June 1953, p. 199-209.

Reports that measured rupture strengths are liable to varying de-

grees of scatter. Photograph, graphs, tables. (Q4, SS)

248-Q. Martensite Formations on Wire Rope. C. M. Zerr. *Drilling,* v. 15, Feb. 1954, p. 61-63, 118.

Scattered spasmodic breaks that appear on wire rope operating over standard, properly designed and maintained sheaves. (Q26, N8, ST)

249-Q. Plated Locknuts Reduce Galling in Titanium Bolts. R. A. Baughman. *Iron Age,* v. 173, Feb. 11, 1954, p. 134-135.

Tests to determine relaxation and galling characteristics of titanium bolts show that best bolt service is obtained by using silver-plated locknuts in combination with rolled threads on bolts. Tables. (Q9, K13, Ti)

250-Q. Observations on Elevated-Temperature Tensile Deformation. R. W. Guard, J. H. Keeler and S. F. Reiter. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 226-227.

Results of experimental studies on effects of prior cold work and strain rate on zirconium and alloy steel. Graphs. 3 ref. (Q23, Zr, AY)

251-Q. High Temperature Strength of Wrought Aluminum Powder Products. Eric Gregory and Nicholas J. Grant. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 247-252.

Creep rupture properties of wrought aluminum powder products made from five grades of sintered aluminum powder were investigated at temperatures from 400 to 900° F. for rupture times up to 1000 hr. Table, diagram, graphs, micrographs. 16 ref. (Q4, H11, Al)

252-Q. Effect of Stress on the Creep Rates of Polycrystalline Aluminum Alloys Under Constant Structure. O. D. Sherby, R. Frenkel, J. Nadeau and John E. Dorn. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 275-279.

Method for study of creep rate dependence of metals on applied stress under condition of constant structure. Method applied to pure aluminum and to dilute solid solution alloys of magnesium, copper, germanium, zinc and silver in aluminum. Graphs, table. 17 ref. (Q3, Al)

253-Q. Plasticity of Molybdenum Single Crystals at High Temperatures. R. Maddin and N. K. Chen. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 280-284.

Single crystals of molybdenum were extended at temperatures from 1300 to 2500° C. With increasing temperatures, yield becomes more pronounced and number of slip bands for equal amounts of elongation decreases. Slip, at high temperatures, fragments the structure. Graphs, diagram, micrographs, tables. 10 ref. (Q23, Mo)

254-Q. Hydrogen Embrittlement of Steels. Jack T. Brown and William M. Baldwin, Jr. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 298-303.

Purpose of investigation was fuller characterization of effects of varying temperature and strain rate on fracture strain of hydrogen-charged steel. Graphs, diagrams. 12 ref. (Q23, ST)

255-Q. On the Torsional Deformation and Recovery of Single Crystals. S. S. Hsu and B. D. Cullity. *Journal of Metals,* v. 6, Feb. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 305-312.

Stress distribution at surface of a twisted cylinder analyzed along boundary of a slip plane of arbitrary orientation. Analysis applied to torsion of cylindrical crystals of magnesium and aluminum. Photographs, tables, diagrams, graphs. 10 ref. (Q24, Mg, Al)

256-Q. A New Theory of Metal Transfer and Wear. I-Ming Feng. *Lubrication Engineering,* v. 10, Feb. 1954, p. 34-38.

Mechanical interlocking effect of plastic roughening of the interface of contacting high spots as primary cause and adhesion or diffusion process induced by temperature flash during breakage of high spots as secondary cause of metal transfer and wear. Diagrams. 12 ref. (Q9)

257-Q. Dislocations or What Makes Metals so Weak? W. T. Read, Jr. *Metal Progress,* v. 65, Feb. 1954, p. 101-106, 168, 170, 172.

Crystal structure and defects or imperfections which permit plastic deformations. Diagrams, photograph. (Q24, M26)

258-Q. Frictional Properties of Titanium and Its Alloys. E. Rabinowicz. *Metal Progress,* v. 65, Feb. 1954, p. 107-110.

Severe galling and metal transfer were noted in sliding applications and high rates of wear in related operations of cutting, draw-

ing and grinding. Diagram, photomicrographs, tables, graph. (Q9, Ti)

259-Q. Properties of Aluminum Bearings. *Metal Progress,* v. 65, Feb. 1954, p. 185-186. (Digest of "Properties and Production of Aluminum Bearings", by Arthur B. Shaw, *Engineering Journal* (General Motors Corp.), v. 1, June-July 1953, p. 49.)

Development of long-lived bearings for automotive use.
(Q general, T7, Al)

260-Q. Correlation Energy in Metals and the Cohesive Energy of Metallic Sodium. S. Raimes. *Physical Society, Proceedings,* v. 67, no. 409A, Jan. 1954, p. 52-56.

Method of Wigner and Seitz for calculating cohesive energy of metallic sodium compared with a recent method of Löwdin. Graphs. 10 ref. (Q23, Na)

261-Q. A Study of Residual Stresses in Flat Beams by Electropolishing Methods. D. J. Demorest and D. O. Leeser. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 45-54.

Investigation involved removal of successive thin, uniform layers of surface material with minimum effect to residual stresses under consideration. Diagrams, tables. 9 ref. (Q25)

262-Q. Device for Applying Uniform Loading to Boundaries of Complicated Shape. A. J. Durelli, R. L. Lake and C. H. Tsao. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 55-61.

New method, consisting of rubber tube in grooved fixture, which conforms to shape of the boundary. Pressure is applied by inflating the tube with compressed gas. Photographs, diagrams, graph, table. 5 ref. (Q25)

263-Q. Effects of Plastic Flow and Work-Hardening in the Experimental Stress Analysis of Magnesium-Alloy Parts. E. H. Schuette. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 81-96.

Results of tests on sand-cast magnesium alloy, giving quantitative illustrations of phenomena involved. Their significance in stress analysis techniques. Graphs, tables. 7 ref. (Q25, Mg)

264-Q. Photoelasticity—A Precision Instrument of Stress Analysis. M. M. Forcht, R. Guernsey, Jr., and D. Landsberg. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 105-112; disc., p. 113-114.

Salient characteristics of technique. New improvements. Graphs, table, stress patterns. 11 ref. (Q25)

265-Q. Initial Fringes in Photoelastic Models and Their Effects. Robert M. Gray. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 115-118.

Includes calculations which will permit separation of initial from final pattern, as well as a correction for direction of stress. Graph, tables. (Q25)

266-Q. Self-Temperature-Compensating SR-4 Strain Gages. R. S. Barker. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 119-128.

Gages, test procedure and test results. Graphs. 3 ref. (Q25)

267-Q. Welded Portal Frames Tested to Collapse. J. M. Ruzek, C. F. Braun, K. E. Kundsen, E. R. Johnston and L. S. Beedle. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 159-180.

Testing apparatus, measurement techniques and testing procedure for investigation of ultimate carrying capacity of welded portal frames. Method of providing lateral support to frames and a simple device for measuring change in curvature of structural members. Photographs, diagrams, graphs, table. 13 ref. (Q25)

268-Q. Use of Brittle Coating Data in Stress Analysis. A. J. Durelli and C. H. Tsao. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 181-196.

Law of failure of brittle coating, state of stress in coating, determination of ultimate strength of coating, analysis of brittle coating data, failure chart of coating and effect of refrigeration. Photographs, diagrams, graphs. (Q25)

269-Q. A New Electric Resistance Strain Gauge for Large Strain. N. L. Svensson. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 197-202.

Development of new type of unbonded electric resistance strain gage which can be designed to measure strains up to 8 or 10%, and yet be in a position to measure elastic strains resulting from unloading the specimen. Diagrams, graphs. (Q25)

270-Q. Two Machines for Combined Bending and Torsion Fatigue. W. N. Findley and W. I. Mitchell. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 203-212.

Design and features of apparatus to convert Krouse plate-bending fatigue machines and Sonntag vibratory fatigue machines for use in tests under combined bending and torsion. Graphs, photographs. 4 ref. (Q7)

271-Q. Machine for Static and Dynamic Testing of Slabs. W. M. Wells, Jr., and R. J. Hansen. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 213-220.

Design and construction of testing machine. Diagrams, graphs, photograph. (Q25)

272-Q. Recording Interferometer for Strain Gage Calibration. A. S. Kobayashi and E. E. Day. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 235-238.

Instrument and its operation. Photographs, diagram, graph. (Q25)

273-Q. An Apparatus for Determining Galling Characteristics and Measuring Coefficients of Kinetic Friction. W. C. Leone and F. F. Ling. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 239-248.

Apparatus for making study of friction and galling characteristics of metals. Graphs, photographs, diagram, table. (Q9)

274-Q. The Hardness of Deuteron Irradiated Molybdenum. I. G. Geib, R. E. Grace and T. C. Harman. Paper from "Conference on Nuclear Engineering, 1953 Proceedings". University of California. p. E11-E24.

Effects of ambient vibrations, load, rate of loading, time of indentation, grain orientation and surface conditions on Vickers hardness number. Graphs, tables. 18 ref. (Q29, Mo)

275-Q. The Effect of Lubrication and Nature of Superficial Layer After Prolonged Periods of Running. F. T. Barwell. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. Institute of Metals, p. 101-122.

Various forms of wear. Taper sections provide evidence that failure proceeds in stages. Microscopic evidence of plastic flow of metal adjacent to a rubbing surface. Graphs, micrographs, photographs. 30 ref. (Q9)

276-Q. The Crystalline Character of Abraded Surfaces. P. Gay and P. B. Hirsch. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. Institute of Metals, p. 123-132; disc., p. 295-364.

Effect of various abrasive treatments on surface structure of calcite were investigated by X-ray and electron diffraction methods. Tables, spectrographs, graph. 20 ref. (Q9, M26)

277-Q. The Effect of Surface Conditions on the Mechanical Properties of Metals, Mainly Single Crystals. E. N. da C. Andrade. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. Institute of Metals, p. 133-143.

With single crystals of metal a thin surface coating of oxide, and possibly of other salts, markedly increases both critical shear stress and stress required to produce further strain after considerable glide has taken place. Graphs. 21 ref. (Q25, Q2, Cd, Zn, Ag, Sn)

278-Q. The Influence of Surface Condition on the Fatigue Strength of Steel. R. J. Love. Paper from "Properties of Metallic Surfaces". Monograph and Report Series 13. Institute of Metals, p. 161-196.

Results have been obtained for carburizing, nitriding, cyaniding, flame hardening, and cold working by rolling, pressing or "presetting". Micrograph, tables. 157 ref. (Q7, ST)

279-Q. The Influence of Surface Films on the Friction and Deformation of Surfaces. F. P. Bowden and D. Tabor. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. Institute of Metals, p. 197-212; disc., p. 295-364.

In absence of all contaminating films, gross seizure occurs and sliding is impossible. At high speeds of sliding, high-temperature flashes are generated at regions of contact and the softened material is smeared over the surfaces to form Beilby layer. Graphs, micrographs, tables. 38 ref. (Q9)

280-Q. (German.) **The Effect of Chemical Composition of Unkilled Aged Steels on Notch Impact Strength.** Heinz Kornfeld. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 469-474.

Impact-temperature curves of 234 steels used to show that effects of composition can be reduced to mathematical formulas. Tables, graphs. 5 ref. (Q6, CN)

281-Q. (German.) **The Effect of Manganese, Nickel, and Vanadium Together With Carbon on Wearing Behavior of Normalized Steels.** Heinrich Arend. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 529-533.

Experimental arrangement. Results of wear tests. Tables, diagrams, graphs. 6 ref. (Q9, AY, Mn, Ni, V)

282-Q. (German.) **The Bauschinger Effect and Its Practical Results.** W. Späth. *Metall,* v. 8, nos. 1-2, Jan. 1954, p. 25-29.

Shows that monocrystals retain

internal stresses even when a displacement was migrated through entire flow area. Effects of cold working. Graphs. 11 ref. (Q24)

283-Q. (German.) **Microhardness Testing in Theory and Practice.** E. M. Onitsch-Modl. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 19, no. 11, Nov. 1953, p. 330-343.

Theory, application and results. Graphs, micrographs, tables. 38 ref. (Q29)

284-Q. (German.) **Hardenability and Strength Properties of Alloyed Structural Steels.** Karl Bungardt, Heinz Kiessler and Ernst Kunze. *Stahl und Eisen,* v. 74, no. 2, Jan. 14, 1954, p. 71-76.

Correlation between hardenability and tensile and notch-impact strength of 12 steels. Tables, graphs. 18 ref. (Q23, Q6, Q27, J26, AY)

285-Q. (German.) **Creep of Steel Wires in Tensile Fatigue Region.** Rudolf Zinsser. *Stahl und Eisen,* v. 74, no. 3, Jan. 28, 1954, p. 145-151.

Steel with 0.39 to 0.76% carbon in form of drawn or heat treated wires was investigated. Photograph, tables, graphs, micrographs. 9 ref. (Q3, CN)

286-Q. (German.) **Laws of Plastic Deformation of Metals Under a Multiaxial State of Stress. II. Tensile and Torsion Experiments on Aluminum Cylinders.** Werner Sautter, Albert Kochendörfer and Ulrich Dehlinger. *Zeitschrift für Metallkunde,* v. 44, no. 12, Dec. 1953, p. 553-565.

Testing equipment. Test results agree with theory of flow, plasticity and deformation. Photographs, diagrams, graphs. 8 ref. (Q24, Al)

287-Q. (German.) **Crystal Growth and Plasticity.** W. Kossel. *Zeitschrift für Naturforschung,* v. 8a, no. 12, Dec. 1953, p. 815-823 + 4 plates.

Plastic deformation and crystal growth from a non-oriented phase are shown to be similar phenomena. Diagrams, micrographs. 9 ref. (Q24)

288-Q. Direct Fatigue Tests With Tensile and Compressive Mean Stresses on 24S-T Aluminium Plain Specimens and Specimens Notched by a Drilled Hole. Gunnar Wallgren. *Aeronautical Research Institute of Sweden, Report* no. 48, 1953, 29 p.

Results show that range of stress at constant lifetime is noticeably higher for a compressive mean stress than for a tensile mean stress of same magnitude. Graphs, photographs, diagrams, tables. 9 ref. (Q7, Al)

289-Q. Twelfth Progress Report of the Rolling-Load Tests of Joint Bars. R. S. Jensen. *American Railway Engineering Association, Bulletin,* v. 55, no. 514, Feb. 1954, p. 814-828.

Covers joint bar wear and failures; revision of design and specifications for new bars; and bars for maintenance repairs. Graphs, micrographs, phtographs, tables. (Q general, S22, CN)

290-Q. Twelfth Progress Report on Shelly Rail Studies at the University of Illinois. R. E. Cramer. *American Railway Engineering Association, Bulletin,* v. 55, no. 514, Feb. 1954, p. 832-840.

Results of rolling-load tests. Photographs, tables, micrographs. (Q general, S22, CN)

291-Q. Final Report on a Three-Dimensional Photoelastic Investigation of the Principal Stresses and Maximum Shears in the Head of a Model of a Railroad Rail. M. M. Frocht. *American Railway Engineering Association, Bulletin,* v. 55, no. 514, Feb. 1954, p. 854-885.

Photo-elastic study of stresses, in a model of the head of a railroad rail, utilizing recent developments in three-dimensional photoelasticity. Graphs, photographs, diagrams. (Q25, CN)

292-Q. A Plastic-Flow Problem Arising in the Theory of Discontinuous Machining. E. H. Lee. *ASME Transactions,* v. 76, Feb. 1954, p. 189-193; disc., p. 193-194.

Solution applies only while fracture surface is being deformed, before plastic flow spreads to initial work surface. Diagrams. 14 ref. (Q24, G17)

293-Q. Dynamic Properties of Nodular Cast Iron. II. Size Effect. Harry Majors, Jr. *ASME Transactions,* v. 76, Feb. 1954, p. 205-216.

Effect of test specimen upon dynamic stress-concentration factor of magnesium-treated cast iron having no nickel content. Graphs, photograph, photomicrographs, tables, diagrams. 26 ref. (Q25, CI)

294-Q. Deviations From Hooke's Law Within the "Elastic Range". Duncan Morrison. *Engineering,* v. 177, Jan. 29, 1954, p. 141-144.

Apparatus developed for measurement of very small plastic strains occurring in steel at stresses within the so-called "elastic limit". Such measurements are of particular interest in study of damping capacity or elastic hysteresis. Photographs, diagrams, graphs. (Q21, Q8, ST)

295-Q. On the Use of Hodographs in Problems of Plane Plastic Strain.

A. P. Green. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 73-80.

Properties and uses of the hodograph of velocity distribution in an ideal plastic-rigid body undergoing plane plastic deformation. Diagrams. 11 ref. (Q24)

296-Q. Calculations and Measurements on Wedge-Indentation. J. Grunzweig, I. M. Longman and N. J. Petch. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 81-86.

Penetration, contact pressure and slip-line dimensions in plastic indentation by a rough wedge are calculated. Results compared with some experimental measurements. Tables, graphs. 2 ref. (Q24)

297-Q. The Plastic Torsion of Anisotropic Bars. R. Hill. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 87-91.

Plastic state of stress examined in an anisotropic prismatic bar twisted by terminal couples. 7 ref. (Q24, Q1)

298-Q. Impact of Finite Beams of Ductile Metal. P. S. Symonds and C. F. A. Leth. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 92-102.

Large plastic deformations of a beam under impact such as that due to a blow of a massive hammer, in which one cross section is suddenly forced to move with a given velocity, are discussed and analyzed. Diagrams, table, graphs. 9 ref. (Q6, Q24)

299-Q. On Eulerian Co-Ordinates in Elastic Wave Propagation. R. E. D. Bishop and J. N. Goodier. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 103-109.

Stress wave passing through an elastic solid is considered by imagining the disturbance to be stationary and the solid to flow through it. 4 ref. (Q25)

300-Q. On Inoue's Hydrodynamical Analogy for the State of Stress in a Plastic Solid. R. Hill. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 110-116.

Mathematical analogy between steady flow of a compressible fluid and equilibrium state of stress in a plastic solid. 9 ref. (Q25)

301-Q. Shells With Zero Bending Stresses. M. R. Horne. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 117-126.

Shells of uniform thickness which will be free from bending stresses when the applied load is any uniform axial force are discussed. Graphs, diagrams, table. 1 ref. (Q5)

302-Q. On the Stress Distribution in the Walls of Pressure Vessels. H. Fessler and R. T. Rose. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 127-136.

Stresses in and near the hemispherical end of a pressure vessel of uniform wall thickness and mean diameter to thickness ratio of ten were determined by frozen stress photo-elastic method. Diagram, graphs, tables. 7 ref. (Q25)

303-Q. Influence of Heat Treatment and Cold Working on Tensile Strength Ranges. Robert L. Stedfeld. *Machine Design,* v. 26, Feb. 1954, p. 163-173.

Methods for raising strength levels for a number of materials and practical significance. Tables, graphs. 5 ref. (Q27)

304-Q. Slip Lines, Etchpits and Corrosion-Pits. A. H. Abdou. *Philosophical Magazine,* v. 45, 7th ser., no. 360, Jan. 1954, p. 105 + 1 plate.

Experiments show that etchpits grouped themselves preferentially along slip lines and certain grain boundaries in addition to a general random distribution. 4 ref. (Q24, Zn)

305-Q. Observations on the Fatigue Fracture of Copper. N. J. Wadsworth and N. Thompson. *Philosophical Magazine,* v. 45, 7th ser., no. 361, Feb. 1954, p. 223-224 + 1 plate.

Experiments on pure copper, fully annealed and tested at constant stress in push-pull at about 1000 cycles per sec. (Q7, Q26, Cu)

306-Q. Possible Sources of Error in Hardness Testing. K. Meyer. *Sheet Metal Industries,* v. 31, no. 322, Feb. 1954, p. 107-113. (Translated from the German by P. Grodzinski.)

Accuracies of basic instruments. Diagram, spectrographs, micrographs. 4 ref. (To be continued.) (Q29)

307-Q. Scratch Hardness Measurement With a Diamond Pyramid. T. Land and B. Sugarman. *Sheet Metal Industries,* v. 31, no. 322, Feb. 1954, p. 140-142, 158.

Evolution of an accurate instrument. Graphs, photographs. 2 ref. (Q29)

308-Q. Hardness Testing of Metals. Technical Papers and Exhibition in Sheffield. *South African Mining and Engineering Journal,* v. 64, pt. 2, Jan. 9, 1954, p. 699, 701.

Review of various aspects and inherent problems associated with accepted methods of hardness testing. (Q29)

309-Q. A Pinch of Boron Doubles Yield Point of Low-Carbon Steel. *Steel,* v. 134, Feb. 22, 1954, p. 107-108, 110.

Combination of 0.5% molybdenum and as little as an ounce of boron turned out to be the right one for a high-tensile, readily weldable steel. Photograph, tables, graph. (Q23, AY)

310-Q. (English.) **Work-Hardening in Stretched and Twisted Aluminium Crystals.** H. W. Paxton and A. H. Cottrell. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 3-8.

Effects of plastic twisting on tensile deformation of aluminum crystals. Tables, graphs. 16 ref. (Q23, Q1, Al)

311-Q. (English.) **On the Strength of Solid Solution Alloys.** J. C. Fisher. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 9-10.

Short-range order shown as important contributor. 4 ref. (Q23, M26)

312-Q. (English.) **The Formation of Mechanical Twins.** B. A. Bilby and A. R. Entwisle. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 15-19.

Examination of stress fields arising during plastic deformation around inhomogeneities of the bounded slip and kink band types. Graphs, table. 16 ref. (Q24)

313-Q. (English.) **Slip Planes and the Energy of Dislocations in a Body-Centered Cubic Structure.** N. K. Chen and R. Maddin. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 49-51.

Modified values of Chalmers and Martius parameter and ratio of Burgers vector to interplanar spacing for planes are derived assuming an alternate slip process. Table, diagram. 9 ref. (Q24)

314-Q. (English.) **Mechanical Deformation of Aluminium Bicrystals.** R. Clark and B. Chalmers. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 80-86.

Specimens composed of two symmetrically oriented crystals having a common axis were subjected to a tensile test. Photograph, tables, diagrams, micrograph, graphs. 30 ref. (Q27, Al)

315-Q. (English.) **Crystallography of Deformation by Twin Boundary Movements in Indium-Thallium Alloys.** Z. S. Basinski and J. W. Christian. *Acta Metallurgica,* v. 2, no. 1, Jan. 1954, p. 101-116.

Geometrical effects of steps (twinning dislocations) in twin boundaries of face-centered tetragonal crystals. Diagrams, micrographs. 14 ref. (Q24, M26, In, Tl)

316-Q. (French.) **Interpretations of Variations in Resilience of a Metal as a Function of Temperature.** Marcel Prot. *Comptes rendus,* v. 238, no. 2, Jan. 11, 1954, p. 205-207.

Observations offer simple explanation for fractures in welded construction. Diagrams. 2 ref. (Q23, K general)

317-Q. (French.) **Influence of Gas Absorption on Mechanical Strength of Metal Wire.** Hubert Forestier and Auguste Clauss. *Comptes rendus,* v. 238, no. 2, Jan. 11, 1954, p. 207-209.

Establishes relation between fracture during stretching of fine wire and nature of gas present. Graph, diagram. 4 ref. (Q26)

318-Q. (German.) **On the Properties of Metal Melts. VII. Internal Friction of Molten Al and Al Alloys.** Erich Gebhardt, Manfred Becker and Stefan Dorner. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 510-514.

Experiments with a torsion-viscometer to determine internal friction of 99.996 aluminum and effect of copper, magnesium, iron, titanium and temperature on viscosity of the melt. Graphs, tables. 24 ref. (Q22, Al)

319-Q. (German.) **Disturbance of Slip in Al Monocrystals. II. Microscopic Investigation of Slip-Band Pictures and Discussion of Mechanism of Deformation.** Hansheinz Lange and Kurt Lücke. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 514-527.

Investigation revealed broken slip bands; band of second slippage; groups and streaks of slip bands; and double, transverse and unexpected slippage. Diagrams, graphs, micrographs. 29 ref. (Q24, Al)

320-Q. (German.) **Shear Deformation of Long Al Monocrystals.** Herbert Scholl. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 528-536.

Apparatus for measuring components of effective force and determining conditions under which shear occurs or crystals are bent. Results discussed. Diagrams, graphs, micrographs. 25 ref. (Q2, Al)

321-Q. (Russian.) **Relation Between Phenomena of Creep and Stress Relaxation in Metals.** I. A. Oding, O. V. Sorokin and N. D. Sazonova. *Doklady Akademii Nauk SSSR,* v. 92, no. 3, Sept. 21, 1953, p. 565-568.

Tests for creep and relaxation of austenite chromium-nickel steel after three separate heat treatments. Graphs. 4 ref. (Q3, SS)

322-Q. (Russian.) **Theory of Formation and Disintegration of Contact Bridges Between Surfaces During Friction.** M. P. Levitskii. *Doklady*

Akademii Nauk SSSR, v. 92, no. 4, Oct. 1, 1953, p. 797-798.

Theoretical discussion on process of convergence of atomic lattices of surfaces during friction. Graph. 5 ref. (Q9, M25)

323-Q. (Russian.) **Effect of Hardening Temperature on Strength of High Speed Steel R9.** E. I. Malinkina. *Stanki i Instrument,* v. 24, no. 12, Dec. 1953, p. 21-23.

Torsion, tension, bending and impact properties shown to decrease sharply with increase of hardening temperature. Graphs, tables. 2 ref. (Q general, J26, TS)

324-Q. Strength of White Irons in the Temperature Range of Hot Tearing. J. P. Frenck and R. W. Heine. *American Foundryman,* v. 25, Mar. 1954, p. 68-72.

Tensile strength of white irons studied varied from nothing to several hundred pounds at temperatures of 2030 to 2200° F. Contraction of a few thousandths of an inch can cause complete tearing. Factors which influence hot tearing may be classified in two principal groups. Inherent characteristics of the metal and external factors not properties of the metal. Graphs, photomicrographs, diagrams, tables. 3 ref. (Q23, Q26, CI)

325-Q. A Tension Impact Test for Sheet Metals. Carl W. Muhlenbruch. *ASTM Bulletin,* 1954, no. 196, p. 43-49; disc., p. 49-50.

Method of machining fittings and specimens as well as permissible tolerances for satisfactory test results. Diagrams, photographs, graphs, tables. 2 ref. (Q6)

326-Q. Mechanism of Creep Deformation in High-Purity Aluminium at High Temperatures. Hsing C. Chang and Nicholas J. Grant. *Institute of Metals, Journal,* v. 82, Feb. 1954, p. 229-235 + 5 plates.

Tests were made at 400, 700 and 1100° F. with stresses from 50 to 1200 psi. Slip was found to be fundamental mechanism. Graphs, diagrams. 12 ref. (Q3, Q24, Al)

327-Q. Changes of Damping Capacity in Quench-Ageing Aluminium-Rich Alloys. K. M. Entwistle. *Institute of Metals, Journal,* v. 82, Feb. 1954, p. 249-263.

Tests conducted on duralumin at constant temperatures up to 65° C. Diagrams, graphs, table. 15 ref. (Q8, N7, Al)

328-Q. Some Metallographic Observations of the Creep of Aluminium—Copper Alloys. A. H. Sully and H. K. Hardy. *Institute of Metals, Journal,* v. 82, Feb. 1954, p. 264-265 + 2 plates.

Results of studies point to importance of grain-boundary stability in creep-resistant alloys. Table. 2 ref. (Q3, Al, Cu)

329-Q. The Creep Deformation of Metals Under Discontinuous Stress and Temperature Conditions. A. J. Kennedy. *Mechanical World and Engineering Record,* v. 134, Feb. 1954, p. 54-57.

Suggests that actual behavior of metals subjected to interrupted stresses may be very different from behavior deduced from standard creep tests. Graphs, diagrams. 4 ref. (Q3)

330-Q. Mechanical Properties of Iron-Chromium-Aluminum Ternary Alloys. I. I. Kornilov and V. S. Mikheev. *Henry Brutcher, Altadena, Calif., Translation no.* 3163, 15 p. (From *Stal,* v. 6, no. 2, 1946, p. 99-104.)

Investigation of hardness, notched-bar impact values, and tensile properties of ternary iron-chromium-aluminum alloys at room temperature and at temperatures up to 1830° F. Diagrams, graphs, tables, micrographs. 13 ref.
(Q29, Q6, Q27, Fe, Cr, Al)

331-Q. Microhardness of Siliconized Cases. N. S. Gorbunov, A. S. Akopdzanyan and N. A. Izgaryshev. *Henry Brutcher, Altadena, Calif., Translation no.* 3167, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 91, no. 2, 1953, p. 285-286.)

Previously abstracted from original. See item 92-Q, 1954. (Q29, L15)

332-Q. (English.) **Analysis of Thin Square Plates Under Normal Pressure and Provided With Edge Frames of Finite Stiffnesses in the Plane of the Plates.** Sigge Eggwertz and Artur Norr. *Aeronautical Research Institute of Sweden, Report no.* 50, 1953, 34 p.

Formulas derived for deflections and membrane stresses including the influence of stiffness of the edge frame. Graphs, photographs, table, diagram. 21 ref. (Q23)

333-Q. (English.) **On the Internal Friction of Ferromagnetic Substances.** Nobuhiko Kunitomi. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 4, Aug. 1953, p. 287-310.

Microscopic eddy currents calculated as a function of magnetization. Results compared with experimental data. Graphs, tables, diagrams. 20 ref. (Q22, P16, SG-n)

334-Q. (English.) **The Measurement of the Young's Modulus of Metals and Alloys by an Interferometric Method. III. The Influence of Heat-Treatment on the Young's Moduli of Fe-Al Al-**

loys, and the Young's Moduli of Ni-Al, Al-Cu Alloys and German Silver in the Annealed State. Tadao Fukuroi and Yoshio Shibuya. *Science Reports of the Research Institutes, Tohoku University,* Series A, v. 5, no. 5, Oct. 1953, p. 405-412.

Young's modulus studied as a function of heat treatment and alloy compositions. Graphs, tables. 11 ref. (Q21, Al, Cu, Fe, Ni, Zn)

335-Q. (Dutch.) **Chemical Composition and Mechanical Properties of Nodular Cast Iron.** J. Kol. *Metalen,* v. 9, no. 2, Jan. 31, 1954, p. 17-21.

Effects of annealing and of magnesium, silicon, carbon and sulfur. Graphs, tables. 19 ref. (To be continued.) (Q general, J23, CI)

336-Q. (Dutch.) **A Remark on the Temperature Dependence of Hardness.** E. D. Kunst. *Metalen,* v. 9, no. 2, Jan. 31, 1954, p. 23-24.

Sudden drop in Brinell hardness at about half the melting temperature on the absolute scale and impression depth as a function of applied load and time in seconds at different temperatures. Graphs. (Q29)

337-Q. (French.) **Stresses in Landing Gears.** A. Gentric. *Docaéro,* 1954, no. 25, Jan., p. 17-38.

Two different types of testing installations for measuring wheel-ground friction coefficients and fatigue rupture. Photographs, graphs, diagrams. (Q9, Q7)

338-Q. (French.) **Contribution to the Study of Elastic Modulus of Metal Alloys.** René Le Roux. *Métaux, Corrosion-Industries,* v. 28, no. 340, Dec. 1953, p. 489-505.

Variations of Young's modulus at room temperature permit observation of physico-chemical reactions of isothermic decomposition of a eutectoid. Florisson method and apparatus. Graphs, tables, diagrams, photograph. 40 ref. (To be continued.) (Q21)

339-Q. (French.) **Cold Sections. Methods of Investigation and Field of Economic Application.** R. J. Shaw and W. Shearer Smith. *Ossature metallique,* v. 18, no. 12, Dec. 1953, p. 609-613; disc., p. 613-616.

Presented at International Congress of Information Centers on Steel at Brussels. Discusses a "U" support compressed axially with respect to failure by buckling and torsion. Presents economic aspects of construction with steel sections. Photographs, graphs, diagrams. (Q28, Q1, ST)

340-Q. (Portuguese.) **Breaks in Ship Boiler Tubes. Studies Conducted in the Instituto Nacional de Tecnologia (Rio de Janiero) for the Purpose of Discovering Their Causes.** A. H. da Silveira Feijo, Silvia Maurell Lobo Radino, Maria Regina Veloso da Silveira, Enio Goulart de Andrade and Hugo Lodewijk Radino. *ABM (Boletim da associacao brasileira de metais),* v. 9, no. 32, July 1953, p. 366-381.

Overheating shown to be principal factor. Steps for preventing it. Photographs, tables, graphs, micrographs. (Q26)

341-Q. (Book.) **Stress Concentration Design Factors.** R. E. Peterson. 155 p. 1953. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $8.50.

Information which will help in stress design calculations. (Q25)

342-Q. (Book—Italian.) **(Plastic Deformation of Metals.) Deformazioni Plastiche dei Metalli.** Sergio Descovich. v. I. 412 p. 1949. Istituto Siderurgico Finsider, Genoa, Italy.

Includes chapters on "Homogeneous Plastic Deformations of Single Crystals"; "Theory of Plastic Deformation of Single Crystals"; "Non-Homogeneous Deformations of Single Crystals. Alternating Deformations—Twinning"; "Plastic Deformations of Poly-Crystals"; "Creep in Polycrystalline Metals"; "Textures From Plastic Deformations"; "Stresses and Strains—Mechanics of Continuous Systems"; "Relations Between Stresses at Yielding"; "Principles of the Mathematical Theory of Plasticity"; and "The Plastic Deformation in the Tensile Test". Graphs, photographs, diagrams, tables. 584 ref. (Q24)

343-Q. Research on Pipe Flanges. *Engineering,* v. 177, Feb. 26, 1954, p. 275-276.

Strain gage tests on creep behavior. (Q25, Q3, CN, AY)

344-Q. Low-Cost Alloys Offer Good Heat Resistance. II. R. W. Boring. *Iron Age,* v. 173, Mar. 11, 1954, p. 146-148.

Mechanical and physical properties of low-cost Cr-Mn-Ni-Si and Cr-Mn-Si alloy steels can replace some of the more expensive and harder to get heat resistant alloys. Photographs, tables. (Q general, P general, AY)

345-Q. Endurance Limit of Zirconium Spreads Over Wide Range. W. P. Wallace and R. H. Wallace. *Iron Age,* v. 173, Mar. 18, 1954, p. 146-147.

Testing of specimens of crystal bar zirconium under repeated stress at room temperature. Zirconium

does not have a clearly defined endurance limit. Graphs, micrographs, tables. (Q7, Zr)

346-Q. Analysis of Plastic Deformation in a Steel Cylinder Striking a Rigid Target. E. H. Lee and S. J. Tupper. *Journal of Applied Mechanics,* v. 21, Mar. 1954, p. 63-70.

G. I. Taylor dynamic compression test consists of firing a cylinder of material to be tested at a target of hardened armor plate and deducing dynamic yield stress from resulting deformation. Theoretical determination of entire strain distribution in such a test cylinder of nickel-chromium steel. Diagrams, photographs, graphs, 9 ref. (Q25, AY)

347-Q. Determination of Stresses in Cemented Lap Joints. C. D. Coxe. *Journal of Applied Mechanics,* v. 21, Mar. 1954, p. 90-91.

Stress-analysis concepts and importance of nonuniform distribution of stresses in brazed joints. 1 ref. (Q25, K8)

348-Q. A Quantitative Measure of Temper Embrittlement. Norman Brown. *Journal of Metals,* v. 6, Mar. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Mar. 1954, p. 361-365.

Theories of flow and fracture show difference in reciprocals of transition temperatures is a quantitative measure of temper embrittlement. Experimental data support this conclusion. Tables, graphs. 18 ref. (Q23)

349-Q. On the Effects of Oxygen on Molybdenum. R. E. Maringer and A. D. Schwope. *Journal of Metals,* v. 6, Mar. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Mar. 1954, p. 365-366.

Embrittlement effect studied by internal friction measurements. Graph, photograph, table, micrograph. 2 ref. (Q23, Q22, Mo)

350-Q. Load-Temperature History of Lattice Strain in Aluminum Alloy. D. Rosenthal and M. Kaufman. *Journal of Metals,* v. 6, Mar. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Mar. 1954, p. 377-380.

Results indicate that neither X-ray nor lattice strains constitute suitable parameter for finding equation of state. Photographs, graphs. 4 ref. (Q27)

351-Q. Discontinuous Flow in Zinc Crystals and Its Relationship to Strain Ageing. M. J. Dumbleton. *Physical Society, Proceedings,* v. 67, no. 410B, Feb. 1954, p. 98-104.

Nitrogen-treated zinc crystals can strain-age under an applied stress and during creep, provided creep rate is small enough. Graphs. 25 ref. (Q24, Q3, Zn)

352-Q. Fatigue Tests of Spot Welds in Cor-Ten and Mild Steel. Georges Welter and André Choquet. *Welding Journal,* v. 33, Mar. 1954, p. 135S-140S.

Fatigue tests and distribution of stresses in multiple Cor-Ten and mild steel spot welded sheets with and without hydrostatic treatment. Tables, diagrams, graphs. 9 ref. (Q7, AY, CN)

353-Q. Behavior of Materials Under Conditions of Thermal Stress. S. S. Manson. Paper from "Heat Transfer Symposium". University of Michigan Press. p. 9-76.

Data contained in recent reports on mathematics of thermal shock. Examines variables in a simplified relation and deduces how thermal stress can be minimized. Graphs, tables, photomicrographs, diagrams. 23 ref. (Q25, Fe)

354-Q. Embrittlement of Austenitic Chrome-Nickel Steels at High Temperatures. I-III. G. Hoch. *Henry Brutcher, Altadena, Calif., Translation no.* 3176-3178. 61 p. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 7-8, 1952, p. 257-276.)

Previously abstracted from original. See item 856-Q, 1952. (Q23, SS)

355-Q. The Effects of Stress Concentrations on the Rupture Strength of Metallic Materials Subjected to Creep Loading. G. Sachs, D. P. Newman and W. F. Brown, Jr. *Henry Brutcher, Altadena, Calif., Translation no.* 3179. 17 p. (From *Zeitschrift für Metallkunde,* v. 44, no. 6, 1953, p. 233-239.)

Previously abstracted from original. See item 765-Q, 1953. (Q23)

356-Q. (English.) **The Theory of Plasticity in Relation to Its Engineering Applications.** Hugh Ford. *Zeitschrift für angewandte Mathematik und Physik,* v. 5, no. 1, Jan. 15, 1954, p. 1-35.

Basic laws of mathematical theory; techniques for solving problems; examples of application of these laws; and techniques to study industrial processes. Diagrams, graphs. 43 ref. (Q23)

357-Q. (Dutch.) **Composition and Mechanical Properties of Nodular Cast Iron.** J. Kol. *Metalen,* v. 9, no. 3, Feb. 15, 1954, p. 34-38.

Effect upon mechanical properties by additions of manganese, phos-

phorus and various other elements (nickel, copper, aluminum, titanium, etc.). Tables, charts. 10 ref. (Q general, CI)

358-Q. (French.) **New Method of Determining Temper Brittleness of Steels.** Bernard Jaoul and Paul Lacombe. *Comptes rendus,* v. 238, no. 7, Feb. 15, 1954, p. 817-819.

Radioactive elements penetrate under steel surface. Procedure is superior to optic microscopy and is applicable to all corrosion problems. Graphs. 3 ref. (Q23, R general, ST)

359-Q. (French.) **Influence of Copper on Some Properties of Gray Iron.** Jacques Foulon and Albert de Sy. *Fonderie,* 1954, Jan., no. 96, p. 3755-3773; disc., p. 3774.

Up to 3% copper increased tensile strength and hardness and reduced impact resistance. Results agree with theoretical predictions. Tables, graphs, micrographs. 18 ref. (Q23, Q6, Q29, CI, Cu)

360-Q. (French.) **The Study of Modulus of Elasticity of Metallic Alloys.** René Le Roux. *Métaux, Corrosion-Industries,* v. 29, no. 341, Jan. 1954, p. 24-36.

Study of anisotropy of elasticity. Tables, graphs, photographs, diagrams. 49 ref. (To be continued.) (Q21)

361-Q. (French.) **C.E.C.M. Conference of Dec. 18, 1953. Results of the Statistical Study of the Mechanical Characteristics of Steels A37 and A42. I-II.** H. Herbiet and L. Dor. *Ossature metallique,* v. 19, no. 2, Feb. 1954, p. 93-103.

Tests and statistical results. Tables, graphs. (Q general, S12, CN)

362-Q. (French.) **Method of Measuring Residual Welding Stresses.** R. Gunnert. *Soudure et Techniques connexes,* v. 8, nos. 1-2, Jan.-Feb. 1954, p. 43-51.

A special extensometer measures distances before and after relieving of stresses between conical impressions spaced 9 mm. apart. Graph, diagrams, photograph, table. 5 ref. (Q25)

363-Q. (German.) **Flexure Analysis of Transfer Surfaces and Its Application in Hall Construction.** K. Hruban. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 3-4, 1953, p. 425-464.

Effects of loads on bearing surfaces in large-span roof construction. Formulas for stress and strain components. Photographs, diagrams, table. 5 ref. (Q27)

364-Q. (German.) **Fatigue Stress and Crystal State. III. Relation Between Crystal Deformation and Hardening or Failure.** Hermann Möller and Max Hempel. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 39-60.

Mechanism of fatigue failure is characterized by transition from homogeneous to nonhomogeneous crystallite deformation and from shear to bending slip. Diagrams, micrographs, tables. 39 ref. (Q7, M26)

365-Q. (German.) **Notch Impact Strength of Soft Fine-Grained Steels in Unaged and Aged State.** Heinz Kornfeld. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 61-70; disc., p. 70.

Formula based on experiments. Tables, graphs. 5 ref. (Q6, ST)

366-Q. (German.) **Strength Properties of Arc Welds of Water Quenched Basic Bessemer Steel.** Jakob Colbus. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 77-84.

Shows superiority of water-quenched, aluminum-killed steels with 0.15 to 0.20% carbon. Diagrams, graphs, tables. 6 ref. (Q23, K1, AY)

367-Q. (German.) **Aluminum-Zinc Alloys. Mechanical Properties of Aluminum-Zinc Alloys With 22 to 70% Aluminum and Influence of Various Additions.** E. Pelzel. *Metall,* v. 8, nos. 3-4, Feb. 1954, p. 83-88.

Effects of magnesium, lead, iron, silicon and up to 5% copper additions. Tables, graphs, micrographs. 14 ref. (Q general, Al, Zn)

368-Q. (German.) **Strain Measurements on Welded Structures.** A. Erker. *Schweissen und Schneiden,* v. 6, no. 2, Feb. 1954, p. 66-69.

Notch effect at undercuts, effect of initial curvature and influence of internal stresses. Diagrams, graphs. 8 ref. (Q25, K general)

369-Q. (German.) **Three Years Experience With Micro-Abrasion Tester.** P. Grodzinski. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 1, Jan. 1954, p. 9-18.

Compares results with other methods. Photographs, graphs, diagrams, table, micrographs. 17 ref. (Q9)

370-Q. (German.) **Investigation of Plastic Supporting Action in Notched Rods.** E. Siebel and A. Hosang. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 4, Feb. 1, 1954, p. 98-101.

Safe average stress in a notched cross section must be below yield stress as determined by tensile test. Graphs, diagrams, tables. 6 ref. (Q27, ST, Al)

371-Q. (German.) **Mechanism of Plastic Deformation.** G. Leibfried and P. Haasen. *Zeitschrift für Physik,* v. 137, no. 1, Feb. 19, 1954, p. 67-88.

Genetic relationships between various stages of plastic deformation of metallic crystals and differences in behavior of cubic face-centered and hexagonal crystals. Phenomenon of plastic flow is discussed. 52 ref. (Q24)

372-Q. (Hungarian.) **The Effect of Chromium and Boron on the Quality of Malleable Cast Iron.** Elek Chapo. *Ontöde,* v. 5, no. 2, Feb. 1954, p. 25-30.

Laboratory and pilot-plant experiments made on cast iron alloys containing 2.5 to 3.0% carbon, 0.9 to 1.2% silicon and 0.2% sulfur. Boron and chromium contents also varied. Tables, graphs, photographs, micrographs. 4 ref. (Q general, B, Cr, CI)

373-Q. (Italian.) **The Damping of Elastic Waves in Lead at High Temperature.** P. G. Bordoni and M. Nuovo. *Nuovo cimento,* v. 11, ser. 9, no. 2, Feb. 1, 1954, p. 127-141.

Damping of longitudinal vibrations measured in range from 10 to 40 kc. and for temperatures between 300 and 600° K. Graphs, diagrams, table. 20 ref. (Q8, Pb)

374-Q. (Russian.) **Nature of Deformation at Yield Stage of Metals.** V. S. Ivanova. *Doklady Akademii Nauk SSSR.* v. 94, no. 2, Jan. 11, 1954, p. 217-220.

Experiments show that in volumes in which stepwise plastic deformation took place, deformation was 2.5% for iron. Graphs. 9 ref. (Q27, Fe)

375-Q. (Russian.) **Influence of Temperature on the Strength of Brittle Metallic Materials.** V. V. Baron and E. M. Savitskii. *Doklady Akademii Nauk SSSR,* v. 94, no. 2, Jan. 11, 1954, p. 269-272.

Tensile and compressive strengths and hardness of copper, silicon, nickel-silicon and copper-silicon alloys, germanium and cobalt. (Q23, Cu, Si, Ni, Co, Ge)

376-Q. (Russian.) **Fatigue Strength of Multiple Welds of Low Carbon Steel and Possible Ways of Increasing It.** A. V. Obukhov, M. M. Kraichik and E. A. Greil. *Vestnik Mashinostroeniia,* v. 33, no. 11, Nov. 1953, p. 81-84.

Spot welding of structural steel. Better results were obtained with double-shear connectors than with the single-shear type. Diagrams, photograph, graphs. 4 ref. (Q7, K3, ST)

377-Q. (Swedish.) **The Mechanism of Fatigue in Metallic Materials.** B. Ström. *Jernkontorets Annaler,* v. 138, no. 1, 1954, p. 17-38.

Survey of literature. Diagrams, graphs, tables, photographs, micrographs. 60 ref. (Q7)

378-Q. (Swedish.) **Checking of Methods for Determining the Primary Permanent Elongation.** G. Malmberg. *Jernkontorets Annaler,* v. 138, no. 1, 1954, p. 39-52.

Methods of determining uniform permanent elongation on different types of structural steels. Importance in cold stretched steel emphasized. Graphs, diagrams. (Q27, ST)

379-Q. **The Determination of the Texture of Sheet Steel From Torque Curves.** L. R. Blake. *British Journal of Applied Physics,* v. 5, Mar. 1954, p. 98-104.

Torque curve used as means of control during mechanical and heat treatment; information on orientation obtained without elaborate analysis. Photographs, tables, diagrams, graphs. 11 ref. (Q24, Fe)

380-Q. **The Load-Deflection Relationship for a Partially Plastic Rolled-Steel Joist.** J. W. Roderick. *British Welding Journal,* v. 1, Feb. 1954, p. 78-82.

Generalized theory which takes account of true stress-strain relationship gives good agreement with observed deflections of simply supported rolled-steel joists when these are loaded well into plastic range. Diagrams, graphs. 5 ref. (Q23)

381-Q. **Vanadium as Replacement for Molybdenum in Low-Alloy Steels.** C. L. M. Cottrell and B. J. Bradstreet. *British Welding Journal,* v. 1, Feb. 1954, p. 82-86.

Substitution results in much lower transition temperature combined with much higher values of proof stress without adversely affecting weldability of steels. Tables, graph, micrographs. 8 ref. (Q23, K9, Va, Mo, AY)

382-Q. **Hardness Conversion Tables.** *Materials & Methods,* v. 39, Mar. 1954, p. 135, 137.

Data sheet of relationships between values determined on Rockwell, Rockwell superficial and Tukon hardness testers. (Q29)

383-Q. **Stress Concentration Problems in Hollow Drill Steel.** W. H. McCormick and H. J. Benecki. *Mining Engineering,* v. 6, Mar. 1954, p. 282-283.

Potential problem areas and suggested solutions. Photographs. (Q25, TS)

384-Q. **On the Nature of Viscous Destruction of Metals.** V. A. Pavlov.

National Science Foundation Translation, no. 100, Oct. 1953, 3 p. (From *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 253-255.)
Previously abstracted from original. See item 91-Q, 1954.
(Q26, Q24, Q6)

385-Q. The Path of the Deformation Process as a Basic Characteristic of the Deformed State of a Plastic Body. S. I. Gubkin and Ye. S. Bogdanov. *National Science Foundation Translation, no.* 125, Nov. 1953, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 88, 1953, p. 967-970.)
The only deformation variable proportional to expended work and to change in the physical state of the metal is intensity. 3 ref. (Q24)

386-Q. Wear Resistance of Carbon Steel Subjected to Rubbing in Certain Liquid Media After Diffusion Chromizing. M. M. Khrushchov, M. A. Babichev and G. N. Dubinin. *National Science Foundation Translation, no.* 196, Feb. 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 92, no. 2, Sept. 11, 1953, p. 303-306.)
Previously abstracted from original. See item 173-Q, 1954.
(Q9, CN, Cr)

387-Q. On the Correspondence Between Relaxation and Rate Characteristics in Plastic Extension. L. I. Vasilyev. *National Science Foundation Translation, no.* 195, Feb. 1954, 2 p. (From *Doklady Akademii Nauk SSSR,* v. 92, no. 2, Sept. 11, 1953, p. 301-302.)
Previously abstracted from original. See item 172-Q, 1954.
(Q23, Sn, Cu, Ni)

388-Q. The Yield Strength of Partly Ordered Cu_3Au Wires. W. D. Biggs and T. Broom. *Philosophical Magazine,* v. 45, 7th ser., no. 362, Mar. 1954, p. 246-248.
Dependence of yield stress on size of ordered domains investigated by tensile deformation of polycrystalline wires. Graph, table. 2 ref.
(Q23, Au, Cu)

389-Q. Etch Pit Attack on Plastically Deformed Aluminium. P. J. E. Forsyth. *Philosophical Magazine,* v. 45, 7th ser., no. 362, Mar. 1954, p. 344-345 + 4 plates.
Removal of surface containing slip steps eliminates tendency for etch pit alignment. 2 ref. (Q24)

390-Q. Ferrous Alloys. A Little Carbon Goes a Long Way. Harry K. Ihrig and John T. Jarman. *Steel,* v. 134, Mar. 22, 1954, p. 96-97.
Less than 1% carbon in steel will increase tensiles several fold. When subsequently heat treated, high hardness is obtained. Phase diagram, table. (Q23, Q29, ST)

391-Q. Hardness Testing Equipment and Methods. John E. Hyler. *Tooling and Production,* v. 19, Mar. 1954, p. 84, 106-112.
Magnetic hardness, multiple-angle testers and microhardness testing. Photographs. (Q29)

392-Q. Experimental Stress Analysis of Stiffened Cylinders With Cutouts. Pure Bending. Floyd R. Schlechte and Richard Rosecrans. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3073, Mar. 1954, 41 p.
Bending tests on a cylindrical semi-monocoque shell of circular cross section. Graphs, photograph, diagrams, tables. 4 ref. (Q25, Al)

393-Q. Fatigue Investigation of Full-Scale Transport-Airplane Wings. Summary of Constant-Amplitude Tests Through 1953. M. J. McGuigan, Jr., D. F. Bryan and R. E. Whaley. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3190, Mar. 1954, 45 p.
Constant-amplitude tests conducted by resonant-frequency method at four different alternating load levels about a level-flight mean load. Photographs, diagrams, tables, graphs. 12 ref. (Q7)

394-Q. Deformation of Single Crystals. Earl R. Parker and Jack Washburn. Paper from "Modern Research in Physical Metallurgy". American Society for Metals, p. 186-204.

Recently developed techniques for investigating deformation characteristics of metals. Photographs, graphs, diagrams, micrographs. 19 ref. (Q24)

395-Q. High Speed Strain Measurements. G. R. Irwin. Paper from "Modern Research in Physical Metallurgy". American Society for Metals, p. 205-224.

Recent experiments on rapid single pulse stressing of metals into plastic range to illustrate factors of primary importance to successful experimental work. Oscillograms, graphs, diagrams. 18 ref. (Q25)

396-Q. The Metallurgical Use of Anelasticity. C. Wert. Paper from "Modern Research Techniques in Physical Metallurgy". American Society for Metals, p. 225-250.
How measurements are made. Interpretates results. Graphs, table, diagrams. 13 ref. (Q22)

397-Q. (French.) New Method of Studying Wear by Means of Radioactive Tracers. Bernard Jaoul. *Comp-*

tes rendus, v. 238, no. 6, Feb. 8, 1954, p. 648-649.

Wear of dies during hot extruding of steels is studied by applying a photographic film of appropriate sensitivity on surface-activated die. Graph, diagram. (Q9, S19, F24, ST)

398-Q. (French.) **Appearance of the Surface of Polycrystalline Specimens Subjected to Work-Hardening and Then to Gradual Annealings.** Jean Hérenguel. *Comptes rendus,* v. 238, no. 6, Feb. 8, 1954, p. 688-690.

Specimens of pure aluminum and Al-3% Mg alloy were deformed up to 400% by rolling. Surface textures were compared with specimens deformed by tension. Photographs. 6 ref. (Q24, Al)

399-Q. (French.) **Internal Friction of Alpha-Iron Due to the Presence of Carbon and Nitrogen in Solution.** Léon Guillet and Bernard Hocheid. *Comptes rendus,* v. 238, no. 8, Feb. 22, 1954, p. 905-906.

Variations of damping studied as a function of temperature. 10 ref. (Q22, Q8, Fe)

400-Q. (German.) **Designing Boiler Parts for Temperatures Exceeding 500° C.** W. Dörrscheidt. *Brennstoff-Wärme-Kraft,* v. 6, no. 3, Mar. 1954, p. 90-92.

Strength properties and admissible stresses of different steels at various temperatures. Graphs. 8 ref. (Q23, ST)

401-Q. (German.) **Strength Properties and Solution Annealing Time of Shapes From Hardenable Aluminum Alloys.** W. Rosenkranz. *Metall,* v. 8, nos. 5-6, Mar. 1954, p. 177-179.

Experimental results. Time for achieving maximum strength is short. Graphs, tables. (Q23, J27, Al)

402-Q. The Ductility of Whiteheart Malleable Iron. G. N. J. Gilbert. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Feb. 1954, p. 169-172 + 6 plates.

Iron of balanced sulfur content having a black fracture is shown to have impact properties at room temperature superior to irons having the conventional whiteheart fracture. Graphs, diagrams, photographs, tables, micrographs. (Q6, CI)

403-Q. The Ductilometer Test. A New Method of Establishing the Ductility of Metals. E. Jonnerby. *Ericsson Review,* 1953, no. 4, p. 119-127.

Design and operation of instrument to determine ductility of wire, sheet or strip. Tables, graphs, photographs, diagrams. (Q23, Cr, Mo, Pb, Al, Cu, CN, SS, Zn)

404-Q. Test Determines Presence of High Residual Stresses in Stainless. Hyman Kirtchik. *Iron Age,* v. 173, Apr. 1, 1954, p. 130-133.

Type 410 stainless steel can be tested to determine whether stresses are high enough to cause cracks in subsequent service. Table, graph. (Q25, SS)

405-Q. Deflections of Laterally Loaded Square Plates Under Various Edge Conditions. Toshio Nishihara and Kichinosuke Tanaka. *Memoirs of the Faculty of Engineering, Kyoto University,* v. 15, no. 4, Oct. 1953, p. 197-212.

Assuming plate is clamped or supported at edges, a fundamental solution is derived suitable to any boundary condition. Coefficients included in solution by various boundary conditions, are determined. Tables. 2 ref. (Q23)

406-Q. Approximate Analysis of Structures in the Presence of Moderately Large Creep Deformations. N. J. Hoff. *Quarterly of Applied Mathematics,* v. 12, Apr. 1954, p. 49-55.

Limiting state of stress and strain approached as creep strain becomes large as compared to elastic strain can be determined on basis of simple nonlinear stress-strain rate law. Graphs. 7 ref. (Q3, Q21)

407-Q. (Russian.) **Effect of Hardening by Heating With High-Frequency Currents on Strength of Cast Iron Parts.** Ia. E. Gol'dshtein. *Vestnik Mashinostroeniia,* v. 34, no. 2, Feb. 1954, p. 55-62.

Experimental investigation. Tables, graphs, micrographs, photograph. 10 ref. (Q23, J2, CI)

408-Q. (Russian.) **High-Frequency Heat Treatment of Ferrite-Pearlitic Malleable Iron.** P. I. Rusin. *Vestnik Mashinostroeniia,* v. 34, no. 2, Feb. 1954, p. 66-67.

Hardness and microhardness tabulated. Hardness increases with pearlite content and C-pockets. Micrographs, tables. (Q29, J2, CI)

409-Q. (Pamphlet.) **Characteristics of Pipe Bends Under Applied Moments; Summary Report Naval Research Laboratory, PB111292.** Dec. 1953, 22 p. Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $0.75.

Preliminary tests to determine applicability of rod theory to tubes indicate that maximum shear stress

in the bend may be more than 200% larger than that calculated for a curved rod of the same section. Also there are significant shear stresses adjacent to the weld in both bend and tangent, even though only in-plane or out-of-plane moments are present. Use of rod theory is considered justifiable in large-bend piping systems, inasmuch as the error is small and calculation is greatly simplified. (Q5)

410-Q. (Pamphlet.) **Shear Stresses in Curved Tubes.** Naval Research Laboratory, PB111249, Oct. 1953, 11 p. Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $0.50.

Relates recently discovered characteristics of pipe bends to work of earlier experimenters. Theoretical solutions to stresses and flexibilities of curved tubes are reported adequate when bend radius is greater than 10-tube radii. Such calculations are also sufficiently accurate for bend radii as low as 2-tube when bend turns through an angle of at least 90° and is not terminated by flanges or other constraints. For lesser bend angles and under conditions of constraint, this report gives more precise experimental values that are not explainable by present theoretical considerations. (Q5, Q2)

411-Q. (Pamphlet.) **Torsional Strength and Stiffness Tests of Wing Leading Edges.** J. F. Besseling and W. K. G. Floor. *Netherlands National Luchtvaartlaboratorium Report* S.421, June 1953, 42 p. + 2 plates.

Torsion tests on 36 wing leading edges stiffened only by full-web ribs. Tables, graphs, photographs, diagrams. 6 ref. (Q1, Al)

412-Q. (Book.) **Characteristics and Applications of Resistance Strain Gages.** National Bureau of Standards Circular 528. 140 p. 1954. U. S. Government Printing Office, Washington 25, D. C. $1.50.

Proceedings of symposium held Nov. 8 and 9, 1951. Proven applications, development of conducting coatings, special temperature compensating gages, and measurement of large plastic strains. (Q25)

413-Q. (Book.) **Statistics and Strength of Materials.** Roland H. Trathen. 506 p. 1954. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $7.50.

Principles of statics and strength of materials and general methods of applying them to engineering problems. (Q general)

414-Q. (Book—French.) **Mathematical Structure of the Theories of Visco-Elasticity.** Bernhard Gross. 74 p. 1953. Herman & Cie, 6, rue de la Sorbonne, Paris, France. $2.00.

A phenomenological theory of visco-elastic behavior based on concept of distribution functions. Analogies of visco-elastic and dielectric behavior; of linear network theory; magnetic after effect; and linear integral equations are stressed. (Q21, P10)

415-Q. The Problem of Thermal Stresses in Aircraft Structures. E. Loveless and A. C. Boswell. *Aircraft Engineering,* v. 26, Apr. 1954, p. 122-124.

Review of various heat sources and sinks, and temperature effects on metals used in structures. Graphs, diagrams. (Q25)

416-Q. Mechanical Aspect of Seizing in Metal Wear. Harry Czyzewski. *ASME, Transactions,* v. 76, Apr. 1954, p. 381-385.

Accounts for accelerated mechanical abrasion. Mechanical analysis explains failure of externally lubricated alloys to equal performance of self-lubricated alloys. Micrographs, photographs, diagrams. 2 ref. (Q9)

417-Q. Most Recent Developments in Rope Testing at the Ontario Research Foundation. O. W. Ellis, M. A. Slaats, K. J. Frampton and H. A. Ellis. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 503, Mar. 1954, p. 170-182; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 102-114.

Equipment and techniques of experimental testing. Tables, photograph, graphs, diagrams. (Q general, CN)

418-Q. Hardness of Solids. D. Tabor. *Endeavour,* v. 13, Jan. 1954, p. 27-32.

Indentation hardness of metal is related to its plastic yield-stress. Extension of work provides very simple physical explanation of familiar Mohs scratch-hardness scale for minerals. Graphs, tables, photographs. 14 ref. (Q29)

419-Q. Recording Signals From Resistance Strain Gauges. I. Introduction and Galvanometer Design. II. Operation of Wire Resistance Strain Gauges at High Power Dissipation. D. A. Senior. *Engineer,* v. 197, Mar. 19, 1954, p. 410-413; Mar. 26, 1954, p. 446-449.

Mounted on ¼-in. steel sheet, gages show no sign of mechanical breakdown at power dissipations of one watt. Power ratings are such that recording of dynamic strains

by galvanometers is practical without recourse to amplifiers. Diagrams, graphs. 2 ref. (To be continued.) (Q25)

420-Q. Recording Signals From Resistance Strain Gauges. III. A Twelve-Channel Direct Strain Recorder. D. A. Senior. *Engineer,* v. 197, Apr. 2, 1954, p. 482-483.

Instrument employs 12 galvanometers, each covering a frequency range extending from zero to 55 cycles per sec. and consists of a recorder control unit and a power unit. Photographs, diagrams. (Q25)

421-Q. Some Unsolved Technical Problems. *Engineering,* v. 177, Mar. 19, 1954, p. 367-369.

Lists problems industries should attempt to solve, including stress corrosion cracking, fatigue damage and notch sensitivity. (Q7, Q23, R1)

422-Q. The Forgeability, Creep Strength, and Ductility of Molybdenum and Some of Its Alloys. J. H. Rendall, S. T. M. Johnstone and W. E. Carrington. *Institute of Metals, Journal,* v. 82, Apr. 1954, p. 345-360 + 2 plates.

Short review of previous work, experimental techniques, effects of alloying elements on forgeability and creep strength and effect of processing variables and alloying additions on ductility. Photograph, tables, micrographs, diagram, graphs. 27 ref. (Q3, Q23, Q24, Mo)

423-Q. Factors Influencing Brittleness in Aluminium-Magnesium-Silicon Alloys. I. R. Harris and P. C. Varley. *Institute of Metals, Journal,* v. 82, Apr. 1954, p. 379-393 + 2 plates.

Effect of composition, heat treatment, cold work and structure on brittleness and mechanical properties of a series of wrought aluminum-magnesium-silicon alloys containing 0 to 2% silicon and 0 to 2% magnesium. Micrographs, photographs, tables, diagrams, graphs. 25 ref. (Q23, Al)

424-Q. Studies on the Creep Recovery and Annealing of Zinc Single Crystals. M. Tanenbaum and W. Kauzmann. *Journal of Applied Physics,* v. 25, Apr. 1954, p. 451-458.

Factors involved in recovery by pure zinc single crystals at 35° C. and the ability to creep following plastic deformation. Phenomenon in which pure zinc single crystals are consistently found to become temporarily hardened by annealing in vacuum above 200 to 260° C. Graphs, table. 14 ref.
(Q3, Q24, J23, Zn)

425-Q. Interpretation of Photoelastic Transmission Patterns for a Three-Dimensional Model. D. C. Drucker and W. B. Woodward. *Journal of Applied Physics,* v. 25, Apr. 1954, p. 510-512.

Work on photoelastic determination of quenching stresses is reexamined and extended. Diagrams. 2 ref. (Q25)

426-Q. Propagation of Longitudinal Deformation Waves in a Prestressed Rod of Material Exhibiting a Strain-Rate Effect. Robert J. Rubin. *Journal of Applied Physics,* v. 25, Apr. 1954, p. 528-536.

Mathematically longitudinal propagation of stresses above yield stress in material exhibiting strain-rate effect. 16 ref. (Q24)

427-Q. Stress Analysis in Design. II. Limitations of Theoretical Methods. J. B. Hartman and R. E. Benner. *Machine Design,* v. 26, Apr. 1954, p. 186-195.

Factors that limit reliability or applicability. Diagrams, graphs, photographs. 19 ref. (Q25)

428-Q. Materials for High Temperature Service. H. R. Clauser. *Materials & Methods.* v. 39, Apr. 1954, p. 117-132.

Superalloys, irons and steels, light metals, ceramics and cermets, plastics and copper and copper alloys. Photographs, graphs, tables. 11 ref. (Q general, P general, SG-h, Cu)

429-Q. Plane Plasticity. B. B. Hundy. *Metallurgia,* v. 49, no. 293, Mar. 1954, p. 109-118.

Fundamental ideas of theory of plasticity as basis for understanding more useful parts of theory. Diagrams, photographs, graphs, table. 43 ref. (Q23)

430-Q. Endurance Limit of Zirconium. W. P. Wallace and R. N. Wallace. *Metal Progress,* v. 65, Apr. 1954, p. 128-129.

Mechanical properties of crystal-bar zirconium including rotating-beam fatigue data. Micrographs, graph, drawing. (Q7, Zr)

431-Q. The Effect of Compressive and Shearing Forces on the Surface Films Present in Metallic Contacts. M. Cocks. *Physical Society, Proceedings,* v. 67, no. 411B, Mar. 1, 1954, p. 238-248.

Two electrical methods were used to examine extent to which oxide or other natural surface films can prevent intermetallic contact when metal bodies are pressed together. Graphs, diagram. 16 ref. (Q28, Q2)

432-Q. Mohs's Hardness Scale—A Physical Interpretation. D. Tabor. *Physical Society, Proceedings,* v. 67, no. 411B, Mar. 1, 1954, p. 249-257.

Suggests relation exists between Mohs's hardness and indentation hardness of minerals. Graphs, diagram. 14 ref. (Q29)

433-Q. The Behaviour of Aluminium Deformed Under Alternating Stresses. N. Louat and M. Hatherley. *Physical Society, Proceedings,* v. 67, no. 411B, Mar. 1, 1954, p. 260-261.

In specimen, slip occurs in second-half cycle on those planes which were operative in first-half cycle, but only at stresses considerably in excess of maximum stress applied in first-half cycle. Light microscope was used. 1 ref. (Q24, Al)

434-Q. Exhaust Valve Maladies. J. A. Newton, J. L. Palmer and V. C. Reddy. *SAE Journal,* v. 62, Apr. 1954, p. 36-40.

Factors affecting diesel-valve fractures and suggested corrections. Tables, photographs, diagrams. (Q26, S21)

435-Q. Results of Edge-Compression Tests on Stiffened Flat-Sheet Panels of Alclad and Nonclad 14S-T6, 24S-T3, and 75S-T6 Aluminum Alloys. Marshall Holt. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3023, Apr. 1954, 18 p.

Investigates compressive strengths of stiffened-flat-sheet panels including range where ultimate strengths approach compressive yield strengths of materials. Graphs, photographs, tables, diagrams. 3 ref. (Q28, Al)

436-Q. Experimental Investigation of the Pure-Bending Strength of 75S-T6 Aluminum-Alloy Multiweb Beams With Formed-Channel Webs. Richard A. Pride and Melvin S. Anderson. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3082, Mar. 1954, 30 p.

Results for 53 multiweb beams of various proportions. Graphs, tables, photograph. 5 ref. (Q5, Al)

437-Q. A Further Investigation of the Effect of Surface Finish on Fatigue Properties at Elevated Temperatures. Robert L. Ferguson. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3142, Mar. 1954, 27 p.

Effects of surface roughness on fatigue properties of low-carbon N-155 alloy with grain size ASTM 6 and S-816 alloy with a grain size of ASTM 6 to 7, at 80, 1200, 1350 and 1500° F. Graphs, micrographs, photographs, tables. 10 ref. (Q7, SG-h)

438-Q. Coefficient of Friction and Damage to Contact Area During the Early Stages of Fretting. II. Steel, Iron, Iron Oxide, and Glass Combinations. John M. Bailey and Douglas Godfrey. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3144, Apr. 1954, 26 p.

Experiments on the start and cause of damage, at frequency of 5 cycles per min., amplitude of 0.006 in., and load of 150 g. in air with relative humidity of less than 10%. Graphs, diagram, tables, micrograph. (Q9, ST, Fe)

439-Q. Study of Antifriction Properties of Chromium Deposits Made Porous by Mechanical Means. D. N. Garkunov and A. A. Poliakov. *Henry Brutcher, Altadena, Calif., Translation no.* 3134, 4 p. (From *Vestnik Mashinostroeniya,* v. 33, no. 6, 1953, p. 65-67.)

Previously abstracted from original. See item 1048-Q, 1953. (Q9, Cr, CI)

440-Q. (English.) **Cold-Rolled and Primary Recrystallization Textures in Cold-Rolled Single Crystals of Silicon Iron.** C. G. Dunn. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 173-183.

Orientation changes are discussed. Oscillogram, tables, stereograms. 22 ref. (Q24, N5, AY)

441-Q. (English.) **Internal Friction in Titanium and Titanium-Oxygen Alloys.** J. N. Pratt, W. J. Bratina and B. Chalmers. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 203-208.

Low-frequency torsional pendulum technique was used in study of alpha-titanium and titanium-oxygen alpha-solid-solutions containing 4.5 atomic % oxygen. Graphs. 21 ref. (Q22, Ti)

442-Q. (English.) **Residual Lattice Strains in Iron Single Crystals.** J. H. Auld and G. B. Greenough. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 209-213.

X-ray diffraction measurements of change in interplanar spacing of iron crystals on plastic extension. The "residual lattice strains" were negligible. Tables, diagrams, radiographs. 6 ref. (Q24, Fe)

443-Q. (English.) **Intergranular Cavitation in Stressed Metals.** J. Neill Greenwood, D. R. Miller and J. W. Suiter. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 250-258.

Cavities appear in intercrystalline boundaries of copper, alpha-brass and magnesium. These are prevalent in boundaries transverse to tensile stress axis. Tables, graphs, micrographs. 15 ref. (Q23, R2, Cu, Mg)

444-Q. (English.) **Creep of Silver Bromide at High Temperature.** R. W. Christy. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 284-295.

Transient and steady-state creep rate of single crystal and polycrystalline specimens stressed in compression from 6 to 150 g/mm. was investigated between 200 and 410° C., with emphasis on steady-state creep of single crystals. Graphs, photograph, table, diagrams. 23 ref. (Q3)

445-Q. (English.) **On the Use of Electrical Resistivity as a Measure of Plastic Deformation in Copper.** R. H. Pry and R. W. Hennig. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 318-321.

Increase in resistivity after room temperature anneal is closely related to stress required to continue deformation. Graphs, diagram. 7 ref. (Q24, P15, Cu)

446-Q. (English.) **Work-Softening in Aluminium Crystals.** R. J. Stokes and A. H. Cottrell. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 341-342.

Tensile specimens of 99.992% aluminum were made into single crystals by strain-anneal method and examined in hard-beam machine at strain rate of 2.5×10^{-5} sec.$^{-1}$ and at temperatures from −185 to +100° C. Diagrams. 2 ref. (Q23, Al)

447-Q. (Dutch.) **Combating Wear and Tear.** H. Blok and G. Salomon. *Metalen,* v. 9; *Handel en Industrie,* v. 9, no. 4, Feb. 28, 1954, p. 26-30.

Maintenance problems of metallic and nonmetallic material wear. Diagram. 7 ref. (Q9)

448-Q. (French.) **Different Forms of the Principle of B. de Saint-Venant.** Walter Schumann. *Comptes rendus,* v. 238, no. 9, Mar. 1, 1954, p. 988-990.

Theoretical study of Saint-Venant's principle with regard to deformation of a prism. 7 ref. (Q24)

449-Q. (French.) **Applications of the Method of Superimposed Lattices to the Study of Various Problems of Elasticity.** Lucien Malavard and Jean Boscher. *Comptes rendus,* v. 238, no. 10, Mar. 8, 1954, p. 1093-1095.

Applications to states of elasticity to planes or surfaces of revolution and to flexure of elastic plates. (Q21)

450-Q. (French.) **Influence of Copper on the Properties of Cast Irons.** *Fonderie,* 1954, Feb., no. 97, p. 3825-3829.

Influence on iron-carbon diagram, graphitization of gray pig, structure and mechanical properties, high-temperature and corrosion resistance and on special cast irons containing nickel, manganese, chromium or molybdenum. Table. 14 ref. (Q general, M27, N8, R general, Cu, CI)

451-Q. (French.) **Contribution to the Study of the Modulus of Elasticity of Metallic Alloys.** René Le Roux. *Métaux, Corrosion-Industries,* v. 29, no. 342, Feb. 1954, p. 66-87.

Modulus of elasticity of copper alloys. Variation as a function of chemical composition. Micrographs, tables, graphs. 15 ref. (Q21, Cu)

452-Q. (French.) **C.E.M.E. Conference, December 18, 1953. Present Results of the Statistical Study of the Mechanical Characteristics of Steels A37 and A42. III. Exploitation of Results for Application to Metallic Construction.** M. Hebrant. *Ossature metallique,* v. 19, no. 3, Mar. 1954, p. 135-141.

Choice of lower limit of elasticity as criterion for calculating admissible stresses; determination of admissible stresses from results of statistical study; and importance of controlling elastic limit and its consequences. Tables, graphs. (Q21, ST)

453-Q. (French.) **New Non-Destructive Process for Determining Residual Stresses of Surfaces.** L. Hausseguy and H. Martinod. *Recherche Aéronautique,* 1954, no. 37, Jan.-Feb., p. 43-50.

Exact determination of "Hertzian hardness" as related to elastic limit. Diagrams, graphs, photograph, tables. 8 ref. (Q25)

454-Q. (French.) **Characteristic Features and Determination of the Concept of Vickers Microhardness.** H. Bückle. *Revue de métallurgie,* v. 51, no. 1, Jan. 1954, p. 1-12.

Comprehensive study of causes of error in microhardness testing. Results show possibility of distinguishing three ranges of Vickers hardness. Table, micrographs, graphs, diagrams. 35 ref. (Q29)

455-Q. (French.) **Effect of Grain Boundaries in Metals and Alloys on Some of Their Mechanical Properties in the Region of Melting Point.** Christian Boulanger. *Revue de métallurgie,* v. 51, no. 3, Mar. 1954, p. 210-218.

Use of Hysteresimeter for studying internal friction and elastic modulus of alloys. Table, graphs, diagram, micrographs. 7 ref. (Q21, Q22, Al)

456-Q. (German.) **On the Calculation of the Strain Energy Associated With the Nucleation of a New Phase Within a Crystal.** E. Kröner. *Acta Metallurgica,* v. 2, no. 2, Mar. 1954, p. 302-309.

Method permits calculation of strain energy provided deformation is caused by difference in volume of

phases and is not too large so that approximations of linear theory of elasticity are not valid. Graph. 10 ref. (Q21)

457-Q. (German.) **Development of a Practical Process of Determining the Transverse Elastic Strain of Test Bars With Measuring Springs. I.** W. Kuntze. *Archiv für technisches Messen,* 1954, no. 218, Mar., p. 65-66.

Measuring-spring arrangement, geometry of system, method of computing transverse strain and use of the device. Diagrams. (Q21)

458-Q. (German.) **Journal Bearing Calculations.** H. Sassenfeld and A. Walther. *Forschung auf dem Gebiete des Ingenieurwesens,* v. 20, Ausgabe B, *VDI Forschungsheft,* no. 441, 1954, 28 p.

Physical problem boundary conditions and mathematical treatment by Reynolds' equations. Graphs, tables, diagrams. 27 ref. (Q9)

459-Q. (German.) **Experiments With Friction Bearing Metals.** W. Peppler. *Forschung auf dem Gebiete des Ingenieurwesens,* v. 20, Ausgabe B, no. 1, 1954, p. 32-33.

Arrangement for testing and oscillographically recording bearing properties of lubricated metals. Diagrams, graph, oscillograms. 5 ref. (Q9, Sn, Sb, Cu, Pb)

460-Q. (German.) **Survey of the Field of Wear.** Hans Wahl. *Metalen,* v. 9, no. 4, Feb. 28, 1954, p. 49-58 + 2 plates.

Comprehensive review of wear problems of bearing materials, tools, abrasives, tires, street surfaces, floor covering and clothing. Tables, graphs, photograph, diagrams. (Q9)

461-Q. (German.) **The Relationship Between Hardness and Tensile Tests.** A. Braun. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 2, Feb. 1954, p. 56-58.

Elasticity, hardness increase and heterogeneity factors most responsible for load dependence in hardness testing. Graphs, table. 2 ref. (Q29, Q27, Cu, Be)

462-Q. (German.) **Influence of Chemical Composition and Quenching Temperature on Increase of Tensile Strength of Water Hardened Spring Wire From Unkilled Basic Converter Steel.** Robert Grimm and Alfred Krüger. *Stahl und Eisen,* v. 74, no. 6, Mar. 11, 1954, p. 331-338.

Effect of composition, quenching temperature and aging. Tables, graphs, micrographs. 14 ref. (Q23, ST)

463-Q. (German.) **Quality Determination of Cog Defects by Measuring Cog Deformation During Engaging Action and Under Operating Stress.** G. Lehnert. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 8, Mar. 11, 1954, p. 213-220.

Plotting deformation of a cog as function of its angular position yields deformation curves of cog stress. Method of evaluating production defects and determining quality of gear-drive mechanism. Photographs, diagrams, graphs. (Q25)

464-Q. (German.) **Shrinkage, Shrinkage Stresses, and Their Effect in Metallic Constructions.** H. Sossenheimer. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 9, Mar. 21, 1954, p. 275-278.

Possibilities of reduction and elimination of shrinkage cracks through plastic straining during welding. (Q25, K general)

465-Q. (German.) **Properties of Metallic Melts. IX. Internal Friction of Liquid Aluminum-Zinc Alloys.** Erich Gebhardt, Manfred Becker and Stefan Dorner. *Zeitschrift für Metallkunde,* v. 45, no. 2, Feb. 1954, p. 83-85.

Melts showed continuous decrease of viscosity with increased temperature. Table, graphs. 13 ref. (Q22, Al, Zn)

466-Q. (Russian.) **Influence of Oxide Films on the Mechanical Properties of Monocrystals of Cadmium.** V. I. Likhtman and V. S. Ostrovskii. *Doklady Akademii Nauk SSSR,* v. 93, no. 1, Nov. 1, 1953, p. 105-107.

Mechanism by which thin oxide films increase creep limits and retard further deformation. Preparation of film and test specimen. Graphs, table. 4 ref. (Q3, Q24, Cd)

467-Q. (Russian.) **Wear of Guides of Rectilinear Motion in Metal Cutting Machines.** V. A. Ambarov. *Vestnik Mashinostroeniia,* v. 33, no. 10, Oct. 1953, p. 26-31.

Experimental investigations. Suggestions to increase life of parts. Diagrams, graphs. 2 ref. (Q9, G17)

468-Q. (Swedish.) **Practical Aspects of Hardness Tests for Strip Steel.** G. Molinder. *Jernkontorets Annaler,* v. 138, no. 2, 1954, p. 81-96.

Advantages of Vicker's method on cross sections. Comparison with Rockwell C. Tables, graphs, diagram. 5 ref. (Q29, ST)

469-Q. **A Statistical Study of the Stress-Rupture Test.** C. W. Phillips and M. J. Sinnot. *American Society for Metals, Transactions,* v. 46, 1954, p. 63-86.

Replicate tests were made on 2S aluminum at 900° F. Variation in fracture time and reduction in area at given stress may be represented by logarithmic-normal distribution while elongation distribution is normal. Graphs, tables, micrographs. 20 ref. (Q4, Al)

470-Q. A Study of Factors Controlling Strength in the Torsion Test. R. D. Olleman, E. T. Wessel and F. C. Hull. *American Society for Metals, Transactions,* v. 46, 1954, p. 87-99.

Tests were studied over a wide range of tempered hardnesses in a 1.0% carbon, 5.0% chromium, 1.0% molybdenum and 0.2% vanadium toolsteel. Diagram, table, graph, photographs, micrographs. 9 ref. (Q1, TS)

471-Q. Effect of Composition on Transverse Mechanical Properties of Steel. C. Wells, J. V. Russell and S. W. Poole. *American Society for Metals, Transactions,* v. 46, 1954, p. 129-156.

Effects on tensile strength, reduction of area and transverse impact strength of certain normalized, quenched and tempered steels. Tables, graphs. 16 ref. (Q27, Q6, ST)

472-Q. Effect of Copper Additions on the Plastic Properties of an Aluminum-Zinc Alloy. C. D. Starr and J. E. Dorn. *American Society for Metals, Transactions,* v. 46, 1954, p. 348-353.

True stress-true strain curves exhibited increasing flow stresses with increasing atomic percentages of copper. Tables, graphs. 9 ref. (Q23, Al, Zn)

473-Q. Flow and Fracture Characteristics of Annealed Tungsten. J. H. Bechtold and P. G. Shewmon. *American Society for Metals, Transactions,* v. 46, 1954, p. 397-408.

Except for temperature at which brittleness occurs, effect of temperature on tensile properties is similar to effect on other body-centered cubic metals. Diagrams, graphs, table, micrographs. 9 ref. (Q26, Q23, W)

474-Q. Notch Ductility of Nodular Iron. W. S. Pellini, G. Sandoz and H. F. Bishop. *American Society for Metals, Transactions,* v. 46, 1954, p. 418-445.

Impact and explosion tests of castings containing a sharp notch were used to evaluate significance of Charpy data to service and to establish comparisons with cast and rolled steels subjected to same tests. Photographs, table, diagrams, micrographs, graphs. 6 ref. (Q6, ST, CI)

475-Q. High-Temperature Steam Pipes. P. H. Margen. *Engineering,* v. 177, Apr. 9, 1954, p. 457-462.

Properties of main high-temperature pipe steels. Suggested working stresses applied to problems of design. Tables, graphs. 17 ref. (Q25, ST)

476-Q. Notch Ductility. S. Downs. *Iron & Steel,* v. 27, Apr. 1954, p. 139-140, 144.

Advantages gained by considering transition temperature instead of only impact value in test at atmospheric temperature. Graphs, tables. (Q23, Q6, AY)

477-Q. The Ultimate Strength of Aluminum-Alloy Formed Structural Shapes in Compression. Robert A. Needham. *Journal of the Aeronautical Sciences,* v. 21, Apr. 1954, p. 217-229.

Method based on assumption that a formed structural shape consisting of a series of flat plate elements can be treated as series of angle sections possessing various degrees of edge support parallel to direction of loading. Graphs, tables, diagrams. 18 ref. (Q28, Al)

478-Q. Research Progress: The Ductility of Molybdenum. *Metal Industry,* v. 84, Apr. 2, 1954, p. 270.

Problem of securing easy workability after heat treatment. 1 ref. (Q23, Mo)

479-Q. Mechanical Properties of Aluminum Electrical Bus. G. W. Stickley and C. O. Smith. *Power Apparatus and Systems,* 1954, no. 11, Apr., p. 100-106.

Data that will assist designer. Results of tensile, compressive and bend tests. Graphs, tables, photographs. 12 ref. (Q23, Q28, Q5, Al)

480-Q. The Surface Temperature of Sliding Solids. F. P. Bowden and P. H. Thomas. *Royal Society, Proceedings,* v. 223, ser. A, Apr. 7, 1954, p. 29-40 + 1 plate.

Temperature developed at points of rubbing contact between a metal and a transparent solid determined by measuring infra-red radiation transmitted through the solid. It is shown that high, fluctuating temperatures occur and results are in general agreement with those obtained by other physical methods. Graphs, diagram, oscillograms. 10 ref. (Q9)

481-Q. Possible Sources of Error in Hardness Testing. K. Meyer. *Sheet Metal Industries,* v. 31, no. 324, Apr. 1954, p. 289-293; disc., p. 293-299, 341. (Translated from German.)

Some sources of error are scratches, cracks, broken out pieces

and matt surface spots. Effects on Brinell and Vickers testers. Micrograph, graph, charts. 5 ref. (Q29)

482-Q. Hardness of Solids. D. Tabor. *South African Mining and Engineering Journal,* v. 65, pt. 1, Mar. 13, 1954, p. 41-43, 45, 47.

Investigations show indentation hardness of metal is related to its plastic yield-stress. Further study shows a simple physical explanation of familiar Mohs scratch-hardness scale for minerals. Graphs, tables, diagram. 14 ref. (Q29)

483-Q. Evaluation of Notch-Bend Specimens. P. P. Puzak and W. S. Pellini. *Welding Journal,* v. 33, Apr. 1954, p. 187S-192S.

Energy transition curve provides significant and practical method of correlation to service pereformance of welded structures based on use of Charpy V-notch specimens. Diagrams, graphs, table. 6 ref. (Q6, K general)

484-Q. Critical Energy Rate Analysis of Fracture Strength. G. R. Irwin and J. A. Kies. *Welding Journal,* v. 33, Apr. 1954, p. 193S-198S.

Mechanical concepts basic to an understanding of fracturing control possibilities and their applicability to large welded structures. Diagram, graph. 8 ref. (Q26)

485-Q. Shearing Resistance of Bolts Partially Embedded in Concrete. D. R. Young and R. A. Hechtman. *Trend in Engineering, (University of Washington),* v. 6, Apr. 1954, p. 16-21.

Ultimate strength of concrete, bolt diameter and length of embedment given the bolt. Graphs, diagrams, photographs, tables. (Q2)

486-Q. Brittle Fracture Studies in the United States. S. L. Hoyt. Paper from "Conference on Brittle Fracture in Steel". West of Scotland Iron and Steel Institute, p. 145-161; disc., p. 326-397.

Investigations in U. S. and their relation to work in rest of world. Basic principles and description of tests. Table, graph. (Q26, CN)

487-Q. The Mechanism of Fracture in Impact Tests. P. Matton-Sjöberg. Paper from "Conference on Brittle Fracture in Steel". West of Scotland Iron and Steel Institute, p. 180-223; disc., p. 326-397.

Standard Charpy keyhole, and Schnadt K_0 tests used. Summarizes factors involved in brittle fracture. Graphs, photographs, micrographs, diagrams, tables. (Q6, CN)

488-Q. Notch Ductility of Mild Steel Ship Quality Plates. I. M. MacKenzie. Paper from "Conference on Brittle Fracture in Steel". West of Scotland Iron and Steel Institute, p. 224-258; disc., p. 326-397.

Statistical investigation of plate from two mills. Concludes that notch ductility of thick plate should be improved. Tables, graphs, micrographs. (Q6, Q23, CN)

489-Q. The Propagation of Brittle Fracture. T. S. Robertson and D. le M. Hunt. Paper from "Conference on Brittle Fracture in Steel". West of Scotland Iron and Steel Institute, p. 259-275; disc., p. 326-397.

Tests support concept of constant force for crack propagation. Graphs, diagrams, tables, photograph, micrograph. (Q26, CN)

490-Q. Transverse Strength and Brittle Fracture. W. Soete. Paper from "Conference on Brittle Fracture in Steel". West of Scotland Iron and Steel Institute, p. 276-293; disc., p. 326-397.

Shows how transition temperature can be determined from variation of transverse fracture strength with temperature. Diagrams, photographs, micrographs, graphs. (Q26, Q23, CN)

491-Q. Dimensions in Testing. C. F. Tipper. Paper from "Conference on Brittle Fracture in Steel". West of Scotland Iron and Steel Institute, p. 294-312; disc., p. 326-397.

Size shown to be of little effect except in presence of a notch. Dimensions determine nature of initiation and propagation of a crack. Graphs, table, diagram. (Q6, CN)

492-Q. The Influence of Welding on Notch-Brittle Fracture. A. A. Wells. Paper from "Conference on Brittle Fracture in Steel". West of Scotland Iron and Steel Institute, p. 313-325; disc., p. 326-397.

Initiation and propagation of cracks during and after welding. Remedial measures. Graphs, diagram. (Q6, K general, CN)

493-Q. The Brittle Fracture Problem From a Shipbuilder's Point of View. N. G. Leide. Paper from "Conference on Brittle Fracture in Steel". West of Scotland Iron and Steel Institute, p. 162-179; disc., p. 326-397.

Temperature, rate of deformation, stress state and material properties as causes of brittle fracture. Table, photographs, diagrams, graphs. (Q6, Q26, CN)

494-Q. (English.) **Investigation on the Strength of 24 S-T Alclad Riveted and Bolted Lap Joints at Rapidly Applied Loads.** J. P. Benthem and R. Kruithof. *Netherlands Nationaal*

Luchtvaartlaboratorium Report S. 415, July 1953, 5 p. + 12 plates.

Load was applied to specimens from 0.01 to 1.5 sec. Load-versus-time diagrams. Diagrams, graphs, photograph. 5 ref. (Q27, K13, Al)

495-Q. (German.) **Review of the Field of Wear and Tear. II-III.** Hans Wahl. *Metalen,* v. 9, no. 5, Mar. 15, 1954, p. 68-74; no. 6, Mar. 31, p. 91-98.

General and specialized basic research. Methods for investigating wear of metals by minerals. Development and testing of various wear resistant materials. Tables, charts, diagrams, photographs. (To be continued.) (Q9, CI, Ni, Cr, AY, Cu)

496-Q. (German.) **Thermal and Mechanical Behavior of Amorphous Solids as Result of Molecular Transpositions.** W. Holzmüller. *Zeitschrift für physikalische Chemie,* v. 202, nos. 5-6, Jan. 1954, p. 440-459.

Softening of amorphous solids, melting of and thermal effect on tensile strength and plastic flow and thermal conductivity crystals, glasses, and resins. Graphs. 15 ref. (Q23, Q24, M26)

497-Q. (Russian.) **Influence of Additions of Alkaline Metals on the Surface Tension and Microhardness of Bismuth.** I. P. Altynov. *Doklady Akademii Nauk SSSR,* v. 93, no. 5, Dec. 11, 1953, p. 845-846.

Comparison of graphs shows that the greater the surface activity of the addition the higher will it raise the microhardness. Graphs. 9 ref. (Q27, P10, Bi)

498-Q. (Russian.) **Critical Stress of a Long Cylindrical Shell During Torsion.** N. A. Alumiae. *Prikladnaia Matematika i Mekhanika,* v. 18, no. 1, 1954, p. 27-34.

Integration of an equation of fourth order satisfying two boundary conditions on each contour of mean surface. Graph. 5 ref. (Q1)

499-Q. (Russian.) **Stability of a Spherical Shell Under Evenly Distributed External Pressure.** V. I. Feodos'ev. *Prikladnaia Matematika i Mekhanika,* v. 18, no. 1, 1954, p. 35-42.

Galerkin method used. Graphs. 7 ref. (Q25)

500-Q. (Russian.) **The Concentration of Stress and Calculation of the Strength of a Shaft Having Transverse Openings.** A. S. Leikin. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 3-14.

Stress distribution in bending and torsion tests of hollow aluminum shafts. Significance of size and slope of holes. Diagrams, graphs, table. 12 ref. (Q25, Al)

501-Q. (Russian.) **Calculation of Disks With Consideration of Plastic Deformation.** R. M. Shneiderovich. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 14-20.

Integral equations of plasticity for problem of supporting capacity, stress and deformation of varied-contour steel disks. Graphs. 4 ref. (Q24, ST)

502-Q. (Russian.) **Second Phase Mechanisms During Testing of Austenite Steel Relaxation.** Ia. S. Gintsburg. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 46-49.

Construction of relaxation curves in semilogarithmic coordinates and their extrapolation for long-term testing has great possibilities in evaluating relaxation. Tables, graphs. 2 ref. (Q3, ST)

503-Q. (Russian.) **Strength of Weld Joints of Low-Alloy and Low-Carbon Steels.** M. M. Kraichik and A. I. Krasovskii. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 63-64.

Compares impact, aging, creep, fatigue and tensile strengths of welding steels. Table, graphs. 3 ref. (Q general, AY, CN)

504-Q. Internal or Residual Stresses in Wrought Aluminium Alloys and Their Structural Significance. G. Forrest. *Royal Aeronautical Society, Journal,* v. 58, Apr. 1954, p. 261-276.

Dangers arising from inhomogeneity, directional properties and residual stresses in design and production of structures. Graphs, tables, diagrams. 29 ref. (Q25, Al)

505-Q. The Strength Properties and Frictional Behaviour of Brittle Solids. R. F. King and D. Tabor. *Royal Society, Proceedings,* v. 223, ser. A, Apr. 22, 1954, p. 225-238 + 4 plates.

Application of adhesional theory of friction to rock-salt, glass and lead sulfide. Tables, graphs, photographs, micrographs. 21 ref. (Q23, Q9)

506-Q. (English.) **Torsion of Cross-Braced Pyramidal Transmission Towers.** P. Csonka. *Acta Technica Academiae Scientiarum Hungaricae,* v. 8, nos. 1-2, 1954, p. 25-36.

Mathematical analysis of bar forces and warping. Diagrams, table. 5 ref. (Q1)

507-Q. (German.) **Stability of Beams of Rectangular Cross Section Suspended at Both Ends.** P. Csonka. *Acta Technica Academiae Scientiarum Hungaricae,* v. 8, nos. 1-2, 1954, p. 79-90.

Mathematical analysis of lateral buckling under uniformly distributed loading. Diagrams. 4 ref. (Q28)

508-Q. (German.) **Internal Stresses From Flame Surface Hardening.** Hans Bühler. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 153-158.

Study of factors causing internal stresses and influence of stress-relief temperature reveals relationship between flame hardening and water-quench method. Tables, graphs. 28 ref. (Q25, J1, J2, ST)

509-Q. (German.) **Effect on Microhardness Curves Due to Instrument Defects.** Reinhart Schulze. *Metalloberfläche,* Ausgabe A, v. 8, no. 4, Apr. 1954, p. 52-54.

Proves maximum values on Grodzynski's hardness curves result from lateral slippage of Vickers hardness tester. Photograph, graphs. 10 ref. (Q29)

510-Q. (German.) **Theory of Strain Hardening Using Creep in Metals.** Gerhard Lucas and Kurt Lücke. *Zeitschrift für angewandte Physik,* v. 6, no. 2, Feb. 1954, p. 64-70.

"Exhaustion theory" shows exponential distribution of activation energy leads to Andrade's parabolic creep law. Effect of temperature and stress. Graph. 23 ref. (Q3)

511-Q. (Hungarian.) **Mechanical Testing of Nonferrous Metals Castings.** Karoly Maréchal. *Ontöde,* v. 5, no. 3, Mar. 1954, p. 66-67.

Suggests examination based on varying shapes and casting technology of individual pieces rather than on properties of test bars. Photographs. (Q general)

512-Q (Book.) **Conference on Brittle Fracture in Steel.** p. 145-406. 1953. West of Scotland Iron and Steel Institute, 39 Elmbank Crescent, Glasgow, Scotland. $6.00.

Consists of eight papers individually abstracted. (Q26, Q23, CN)

513-Q. (Book.) **The Elevated-Temperature Properties of Chromium-Molybdenum Steels.** 212 p. 1953. American Society for Testing Materials, Philadelphia 3, Pa. $4.75.

Elevated-temperature data including tensile and yield strengths, percent elongation, reduction in area, and stresses for rupture and creep rates. (Q27, Q3, Q4, AY)

514-Q. (Book.) **Mechanics of Materials.** Philip G. Larson and William J. Cox. 3rd Ed. 414 p. John Wiley and Sons Inc., 440 Fourth Ave., New York 16, N. Y. $5.75.

Fundamental principles underlying machine and structural design. Examines physical behavior of stressed bodies, not merely from viewpoint of its mathematical expression, but also in light of practical problems that confront engineer. (Q general)

515-Q (Book.) **Rigid Frame Formulas.** A. Kleinlogel. 1st Ed. Frederick Ungar Publishing Co., 125 E. 24th St., New York 10, N. Y. $10.00.

Ready-to-use formulas for structural engineers will save many design hours. Elastic theory results may complement plastic design procedure. (Q21, Q23, T26)

516-Q. (Book.) **Steel Construction.** 5th Ed. 432 p. 1953. American Institute of Steel Construction, 101 Park Ave., New York 17, N. Y. $3.00 (thumb index) $2.00 (plain).

Book designed to provide maximum convenience for estimator, designer, and detailer, rather than to adhere to strictly academic classification. (Q general, T26, ST)

517-Q. **The Torsion of Solid Regular Hexagonal Shaft by Relaxation Methods.** B. V. Saroja. *Indian Institute of Science, Journal,* v. 36, sec. B, Apr. 1954, p. 37-42.

Mathematical determination of stress function in prismatic bar with uniform cross section. Diagrams. 3 ref. (Q1)

518-Q. **Isothermal Temper Embrittlement and the Effect of Hardness on Transition Temperature.** B. C. Woodfine. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 532-533.

Changes in transition temperature taking place on tempering a low-alloy steel above 650° C. can be explained by normal processes of tempering and are not result of abnormal embrittling change. Graph. 11 ref. (Q23, J29)

519-Q. **Mechanical Properties of Beryllium Fabricated by Powder Metallurgy.** W. W. Beaver and K. G. Wikle. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 559-573.

General survey of mechanical properties of commercially pure beryllium fabricated from powder by vacuum hot pressing and other consolidation methods. Effect of fabrication method, grain size, strain rate and directionality upon both room and elevated temperature tensile properties. Tables, diagrams, photographs, graphs. 12 ref. (Q general, H general, Be)

520-Q. **Mechanical Properties of Beryllium Copper at Subzero Temperatures.** J. T. Richards and R. M. Brick. *Journal of Metals,* v. 6, May

1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 574-580.

Experimental data on beryllium-copper, beryllium-cobalt-copper and beryllium-zinc-copper in wrought and cast conditions. Influence of cold work and age hardening treatment upon subzero behavior. Effects of temperature upon both elastic and plastic deformation. Graphs, tables. 11 ref.
(Q21, Q23, Be, Cu, Co, Zn)

521-Q. **475° C (885° F) Embrittlement in Stainless Steels.** A. J. Lena and M. F. Hawkes. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 607-615.

Changes in hardness, tensile properties, microstructure, electrical resistance and X-ray diffraction effects indicate lattice strains are necessary for embrittlement of ferritic stainless steels when heated for relatively short times at 475° C. Graphs, tables, micrographs, radiograms. 24 ref. (Q23, SS)

522-Q. **Mechanism of Ortho Kink-Band Formation in Compressed Zinc Monocrystals.** J. J. Gilman. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 621-629.

Dependence of ortho kink-band formation on crystal orientation, temperature and conditions at ends of specimen. Photographs, diagrams, graphs, micrographs. 13 ref. (Q24, Zn)

523-Q. **Creep Behavior of Magnesium-Cerium Alloys.** C. S. Roberts. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 634-640.

Photographic study of microstructural changes between 300 to 600° F. shows outstanding creep resistance results primarily from potent precipitation hardening locally at grain boundaries. Tables, graphs, micrographs. 17 ref. (Q3, Mg, Ce)

524-Q. **The Influence of Carbon and Manganese on the Properties of Semi-killed Hot Rolled Steel.** F. W. Boulger and R. H. Frazier. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 645-652.

Effects on grain size and tensile and notched bar properties. Tables, graphs, diagrams, micrographs. 13 ref. (Q23, M27, AY)

525-Q. **Impact Transition Temperatures of Some Pearlite-Free Mild Steels as Affected by Heat Treatments in the Alpha Range.** Ake Josefsson. *Journal of Metals,* v. 6, May 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, May 1954, p. 652-659.

Transition temperatures of 0.01 to 0.02% carbon steels shown to be strongly influenced by cooling rate in alpha range, quenching from the lower critical point causing very low transition temperature even after strain aging. Tables, graphs, micrographs. 13 ref. (Q6, CN)

526-Q. **Introduction to Directionality in Copper.** (Digest of "Directionality in Rolled Copper and Brass", by G. L. J. Bailey, *Sheet Metal Industries,* v. 30, Aug. 1953) *Metal Progress,* v. 65, May 1954, p. 190, 192.

Previously abstracted from original. See item 825-Q, 1953. (Q24, Cu)

527-Q. **Relation Between Vickers Microhardness and Macrohardness.** R. Schulze. *Microtecnic (English Ed.),* v. 8, no. 1, 1954, p. 13-26. (Translated from the German.)

Elastic recovery of indentation can be ignored in macro but not in microhardness range. Formula for correlation. Graphs, micrographs, diagrams. 12 ref. (Q29)

528-Q. **Installation Torque vs. Stress in Standard AN Bolts.** *Product Engineering,* v. 25, May 1954, p. 158-160.

Evaluation of tests to determine correct torque to produce expected bolt stress. Tables, graphs, diagram. 4 ref. (Q1)

529-Q. **Endurance Strength. Nitriding vs. Shot-Peening.** *Tooling and Producion,* v. 20, May 1954, p. 52-54.

Fatigue-life relationship between nitriding and shot peening on an automotive-type crankshaft. Tables, graph, photograph.
(Q7, J28, G23, CN, AY)

530-Q. **Brinell Hardness Numbers for Various Loads.** *Welding Engineer,* v. 39, May 1954, p. 71.

Data sheet for loads ranging from 500 to 3000 kg. (Q29)

531-Q. **Materials for Low-Temperature Service.** Francis B. Foley. Paper from "Materials for Product Development 1953". Clapp & Poliak, p. 144-159; disc., p. 159-161.

Various aspects of selection, design and testing of metals for service down to −328° F. Diagrams, graphs, tables. (Q general)

532-Q. (German.) **A Contribution to the Theory of Orthotropic Plates.** Witold Nowacki. *Acta Technica Aca-*

demiae Scientiarum Hungaricae, v. 8, nos. 1-2, 1954, p. 109-128.

Greenian function derived where close form is used instead of infinite series. Diagrams, graphs. (Q25)

533-Q. (Hungarian.) **Manganese-Titanium Carburized Economy Steels.** Nandor Hajto. *Kohaszati Lapok,* v. 9, no. 2, Feb. 1954, p. 59-68.

Effect of titanium on various steels made with Hungarian alloying elements. Mechanical properties of various specimens. Results of case hardening. Tables, graphs. 10 ref. (Q general, J28, AY)

534-Q. (Polish.) **Formation of Cracks in Rails.** Jozef Gorecki. *Hutnik,* v. 21, no. 2, Feb. 1954, p. 35-40.

Causes of breaks, open and hairline cracks and tangential stresses in the rail head. Diagrams, micrographs, photographs, graph table. 1 ref. (Q26 CN)

535-Q. (Russian.) **Nature of Fracture During Plastic Deformation of Metals.** S. I. Gubkin and L. A. Rapoport. *Doklady Akademii Nauk SSSR,* v. 94, no. 4, Feb. 1, 1954, p. 685-688.

Formation of tensile stress, structural changes induced by recrystallization and formation of new phases. Micrographs. 4 ref. (Q24, N5)

536-Q. (Russian.) **Hardness of Gamma-Solid Solutions in the System Iron-Carbon at High Temperatures.** K. A. Osipov and E. M. Miroshkina. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1065-1067.

Investigation on Armco iron and iron with 0.36 to 1.04% carbon, 0.13 to 0.20% silicon and 0.20 to 0.33% manganese at temperatures between 910 and 1100° C. Table, graphs. 5 ref. (Q29, Fe)

537-Q. (Russian.) **Creep of Tin Monocrystals.** E. P. Zakoshchikova. *Doklady Akademii Nauk SSSR,* v. 95, no. 3, Mar. 21, 1954, p. 575-577.

Plastic flow at stresses lower than creep limit. Influences of surface active substances. Graphs. 5 ref. (Q3, Sn)

538-Q. (Russian.) **Precision of Engine-Wear Investigation by the Method of Radioactive Tracers.** Iu. S. Zaslavskii, G. I. Shor and F. B. Lebedeva. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 1, Jan. 1, p. 54-60.

Simultaneous investigation on single-cylinder engine by radioactive tracers, weighing the piston ring, alveolar deposition on the piston ring and plotting of a wear diagram on the basis of the amount of iron in the lubricating oil. Graphs, tables, diagrams. 4 ref. (Q9)

539-Q. (Russian.) **Deformability of Pressure Worked Bronzes.** S. I. Gubkin and Iu. A. Tsvaigel. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 1, Jan. 1, p. 128-137.

Investigation of aluminum-iron, beryllium and tin-phosphorus bronzes at temperatures of 20 to 900° C. Tables, graphs. 1 ref. (Q24, Cu)

540-Q. (Swedish.) **High-Temperature Yield Point of Welded Stainless Steels.** Tore Norén and Bengt Ramshage. *Svetsaren,* v. 18, no. 4, 1953, p. 47-48.

Chromium, Cr-Ni, Cr-Ni-V and Cr-Ni-Mo steels tested at temperatures up to 400° C. Tables, graphs. (Q27, K general, SS)

541-Q. Tests on Magnesium-Zirconium Alloy Castings. *Aircraft Engineering,* v. 26, May 1954, p. 162-163, 167.

Porosity and strength checked by static pressure pulsation tests. Tables, diagrams. (Q23, Mg, Zr)

542-Q. Measurement of Stresses Imposed on Wheels in Diesel-Locomotive Service. L. L. Olson. *ASME, Transactions,* v. 76, May 1954, p. 613-616.

Objectives, test procedures and instrumentation of proposed program to determine causes of wheel failures. Photographs, diagrams. (Q25, ST)

543-Q. A Concept of Fatigue Damage. S. M. Marco and W. L. Starkey. *ASME, Transactions,* v. 76, May 1954, p. 627-632.

Stepwise varying stress sequences applied to rotating cantilever-beam specimens. Typical curves of fatigue damage versus cycle ratio were deduced. Graphs, micrographs, tables. (Q7, Al, AY)

544-Q. Thermal-Shocking Austenitic Stainless Steels With Molten Metals. R. A. Tidball and M. M. Shrut. *ASME, Transactions,* v. 76, May 1954, p. 639-643.

Specimens of AISI 347 pipe and pipe welds were subjected to repeated thermal shocks by quenching inner surface with cool sodium-potassium alloy. Equipment used and method of measuring transient fluid and wall temperatures. Diagrams, graphs. (Q25)

546-Q. Thermal Checking of Wrought-Steel Railway Wheel Material. H. R. Wetenkamp. *ASME, Transactions,* v. 76, May 1954, p. 649-654.

Mechanism of formation of small cracks formed as result of two heat cycles. Table, photographs, graphs. 5 ref. (Q26, ST)

547-Q. Temper Embrittlement in Blackheart Malleable and Nodular Cast Irons. G. N. J. Gilbert. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Apr. 1954, p. 249-263 + 4 plates.

Ferritic and blackheart irons with high silicon and phosphorus contents, previously slowly cooled from 690° C., become embrittled when heated for short times in range from 400 to 600° C. and quenched. Molybdenum decreases degree of embrittlement due to treatment at 450° C., both in irons quenched and slowly cooled from 650° C. Photographs, micrographs, graphs, tables. 11 ref. (Q23, CI)

548-Q. Better Submarine Hull Is Goal of Model Basin Work. R. E. Stark. *Bureau of Ships Journal,* v. 3, May 1954, p. 20-24.

Theoretical analyses of structural problems inherent in submarine design. Photographs, diagrams. (Q general, T21)

549-Q. Properties of Titanium Bolts. R. A. Baughman. *Tool Engineer,* v. 32, June 1954, p. 84.

Tensile, torque-tensile, galling and relaxation tests made to determine use on gas turbines. Graph, table. (Q23, Q1, Q9, Q3, Ti)

550-Q. Some Further Observations on the Fatigue Process in Pure Aluminium. P. J. E. Forsyth. *Institute of Metals, Journal,* v. 82, May 1954, p. 449-455 + 3 plates.

Similarities and differences of deformation produced by cyclic and static stressing investigated microscopically and by multiple-beam interference technique. Micrographs, photograph. 6 ref. (Q7, Al)

551-Q. A Theory of Hydrogen Embrittlement. F. de Kazinczy. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 85-92.

Relation between hydrogen content and strength and ductility of steel. Graphs. 21 ref. (Q23, ST)

552-Q. Tensile and Impact Properties of Fe-Si, Fe-Ni, Fe-Cr, and Fe-Mo Alloys of High Purity. W. P. Rees, B. E. Hopkins and H. R. Tipler. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 93-110 + 1 plate.

Tough-to-brittle transition at various temperatures. Micrographs, graphs, tables. 15 ref. (Q23, Q6, Fe, Si, Ni, Cr, Mo)

553-Q. Effect of Heat-Treatment on the Brittleness of High-Purity Iron-Nitrogen Alloys. B. E. Hopkins and H. R. Tipler. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 110-117 + 1 plate.

Tensile and notch impact tests on two alloys in tough-to-brittle transition. Tables, graphs. 13 ref. (Q23, Q6, Fe)

554-Q. Practical Aspects of Hardness Testing of Steel Strip. G. Molinder. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 159-164.

Applicability of some generally accepted methods on hardened cold rolled strip. Diagram, graphs, tables. 4 ref. (Q29, ST)

555-Q. Postbuckling Behavior of Axially Compressed Circular Cylindrical Shells. Joseph Kempner. *Journal of the Aeronautical Sciences,* v. 21, May 1954, p. 329-335, 342.

Mathematical analysis of applied stresses. Graphs. 10 ref. (Q25)

556-Q. Large Elastic Deformations of Homogeneous Anisotropic Materials. J. L. Ericksen and R. S. Rivlin. *Journal of Rational Mechanics and Analysis,* v. 3, May 1954, p. 281-301.

Problem for materials possessing transverse isotropy mathematically solved. 11 ref. (Q21)

557-Q. Determination of the Plastic Yield Condition as a Variational Problem. T. Y. Thomas. *National Academy of Sciences of the United States of America, Proceedings,* v. 40, May 1954, p. 322-331.

Mathematical analysis of condition that plastic flow occurs in such a way as to minimize a certain energy integral taken over region of flow. (Q23)

558-Q. Study of a Deformed State by Radioactive Isotopees. S. I. Gubkin and S. A. Dovnar. *National Science Foundation Translation, no.* 145, Dec. 1953, 2 p. (From *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 1089-1090.)

Previously abstracted from original. See item 95-Q, 1954. (Q24, S19)

559-Q. Relation Between Creep and Relaxation of Stresses in Metals. I. A. Oding, O. V. Sorokin and N. D. Sazanova. *National Science Foundation Translation, no.* 152, Dec. 1953, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 92, 1953, p. 565-568.)

Previously abstracted from original. See item 321-Q, 1954. (Q3, SS)

560-Q. A New Technique for Investigating Surface Flow in Metal-Working Processes. J. M. Capus and M. G. Cockcroft. *Nature,* v. 173, May 1, 1954, p. 821.

Surface scratches provide valuable means of investigating topography of surface flow during deformation. Micrograph. 1 ref. (Q24)

561-Q. The Economics of Tank Failures. F. A. Gitzendanner. *Petro-*

leum Refiner, v. 33, May 1954, p. 160-162.

Failures, about 32 per 110,000 tank-yr. service, are generally brittle-type. Some can be avoided. Tables. 2 ref. (Q23, CN)

562-Q. Lattice Imperfections and Plastic Deformation in Metals. I. Nature and Characteristics of Lattice Imperfections, Notably Dislocations. H. G. van Bueren. *Philips Technical Review,* v. 15, Feb.-Mar. 1954, p. 246-257.

Geometrical aspects and behavior under shear stress. Micrographs, diagrams. 15 ref. (Q24, M26)

563-Q. A Method for Determining the "Safe" Life of an Aircraft Wing From Fatigue Test Results. A. P. Kennedy. *Royal Aeronautical Society, Journal,* v. 58, May 1954, p. 361-366.

Basis of method is assumption that fatigue test results can be represented by a log-normal distribution. Statistical methods employed to determine probability of a wing boom being capable of withstanding a particular number of reversals to failure. Graphs, tables. 4 ref. (Q7)

564-Q. Some Notes on the Torsion-Bending Constant. J. Solvey. *Royal Aeronautical Society, Journal,* v. 58, May 1954, p. 367-370.

Important in calculation of buckling loads under compression of struts failing in torsional or torsional-flexural mode. (Q1, Q5)

565-Q. The Influence of Oxide and Lubricant Films on the Friction and Surface Damage of Metals. W. Hirst and J. K. Lancaster. *Royal Society, Proceedings,* v. 223, ser. A, May 6, 1954, p. 324-338 + 1 plate.

Differences in protection given by different oxide films on same metal were noticeable in presence of lubricant. Oxide film with poor protective properties can completely inhibit potential protective action of lubricant. Micrographs, graphs, tables. 18 ref. (Q9)

566-Q. The Elastic Deformations of a Plate Near a Hole With a Stiffening Rim. R. B. Harvey. *Royal Society, Proceedings,* v. 223, ser. A, May 6, 1954, p. 338-348.

Solution of equations of generalized plane stress obtained for plate under tension when a rim of material of different thickness is between two bounding curves. 8 ref. (Q21)

567-Q. The Formation of Cracks as a Result of Plastic Flow. A. N. Stroh. *Royal Society, Proceedings,* v. 223, ser. A, May 6, 1954, p. 404-414.

Stresses around a piled-up group of dislocations investigated with reference to initiation of a crack. A crack should form when group consists of about 1000 dislocations in a cold-worked metal. 14 ref. (Q24)

568-Q. How Processing Introduces Residual Stresses. R. L. Mattson. *SAE Journal,* v. 62, May 1954, p. 58-59.

Abridged from "Effects of Residual Stress on Fatigue Life of Metals" presented at SAE Annual Meeting, Detroit, Jan. 1954. Summary for designers and production men. Table. (Q25, Q7)

569-Q. Experiences With the Double-Cone Indenter. P. Grodzinski. *Sheet Metal Industries,* v. 31, no. 325, May 1954, p. 383-390.

Stresses need for new form of hardness indenter. Basic advantages not given by other equipment presented and proven. Photographs, diagrams, graphs, micrographs. (Q29)

570-Q. The Mechanics of Stress and Strain Occurring in a Fourdrinier Wire. John D. Lyall. *Tappi,* v. 37, May 1954, p. 207-214; disc., p. 215-216.

Method calculates tensile and bending stresses induced in a single wire, at various positions around the fourdrinier. Graphs, diagrams, photographs, tables. 9 ref. (Q23, Q5)

571-Q. Increase Tap-Drill Diameters and Save Money. M. L. Begeman and C. C. Chervenka. *Tool Engineer,* v. 32, June 1954, p. 61-65.

Tests to determine optimum relationship existing between strength of threaded connections and tapping expense. Photographs, diagram, graphs, table. (Q23, G17)

572-Q. Directionality of Mechanical Properties in Hot-Worked Steels. A. R. Troiano and L. J. Klingler. *Welding Journal,* v. 33, May 1954, p. 209S-217S.

Extent to which directionality is influenced by processing variables. Graphs. 29 ref. (Q24, ST)

573-Q. High-Pressure Vessels Subjected to Static and Dynamic Loads. E. D. Narduzzi and Georges Welter. *Welding Journal,* v. 33, May 1954, p. 230S-238S.

Elastic stress-strain relations for external and internal walls for cylindrical shells subjected to internal pressure. Comparison of actual to theoretical stresses. Application of various theories of fracture. Suggestions for design formulas. Tables, graphs, diagrams, photographs. 7 ref. (Q21, Q26)

574-Q. Stresses for Pressure Vessels and Boilers Up to 650° F. W. P. Kerkhof. *Welding Journal,* v. 33, May 1954, p. 239S-251S.

Calculation and rupture theory for vessels subjected to internal pressure. Tables, diagrams. (Q25)

575-Q. (Czech.) **Steel Properties for Cast Kalpan Turbine Blades.** Alexander Nemes. *Slévarenstvi,* v. 2, no. 1, Jan. 1954, p. 2-9.

Advantages, limitations, chemical analysis and mechanical properties of various types of steel. Tables, graphs. 3 ref. (Q general, T25, AY, SS)

576-Q. (Czech.) **Cracks in Gear Wheel Castings.** Josef Pribyl. *Slévarenstvi,* v. 2, no. 1, Jan. 1954, p. 17-22.

Disadvantages of rigid construction and influence of thermal conductivity of material. Diagrams. 4 ref. (Q26, P11, CI)

577-Q. (French.) **Measurement of Photo-Elastic Stresses.** Roger Fleury and Félix Zandman. *Comptes rendus,* v. 238, no. 15, Apr. 12, 1954, p. 1559-1561.

Use of plastic photo-elastic material permits direct outlining of stresses on surfaces. Graph. (Q25)

578-Q. (French.) **Relation Between Fibrous Structure and Deformation Mechanism in Machined Chips as Determined by X-Rays.** Paul Bastien and Michel Weisz. *Comptes rendus,* v. 238, no. 15, Apr. 12, 1954, p. 1583-1585.

Formula offers solution of plastic flow problems on carbon, sulfur and chromium-molybdenum steels and aluminum alloys. Diagrams. 9 ref. (Q24, G17, CN, AY, Al)

579-Q. (French.) **Effect of Ultrasound on Temper of Metals.** J. Palmé. *Métaux, Corrosion-Industries,* v. 29, no. 343, Mar. 1954, p. 100-104.

Steel and duralumin specimens tested for hardness and aging. Tables, micrographs, graphs. (Q29, N7, ST, Al)

580-Q. (French.) **Experimental Measurement of Torsion Vibrations. The Triangle Diagram.** Roger Fleury. *Métaux, Corrosion-Industries,* v. 29, no. 343, Mar. 1954, p. 105-110.

Method records vibrations of shaft or axle torsion. Photographs, graphs, diagrams. (Q9, Q1)

581-Q. (French.) **Contribution to the Study of the Modulus of Elasticity of Metal Alloys.** René Le Roux. *Métaux, Corrosion-Industries,* v. 29, no. 343, Mar. 1954, p. 111-132.

Thermo-elastic study and isothermal decomposition of eutectoid of aluminum bronzes. Tables, graphs, micrographs, diagram. 26 ref. (Q21, Cu)

582-Q. (French.) **Plastification of Soft Steel Plate-Web Girders.** A. Lazard. *Ossature metallique,* v. 19, no. 5, May 1954, p. 274-284.

Fatigue properties of iso and hyperstatic girders. Graphs, diagrams, table. (Q7, ST)

583-Q. (French.) **Improving the Stability of Resistance Strain Gages Subjected to Alternating Forces.** Georges Vidal, Jean Laxague and Pierre Lanusse. *Recherche Aéronautique,* 1954, no. 38, Mar.-Apr., p. 53-56.

Tests on steel and aluminum alloys. Diagrams, tables, photograph, micrograph. (Q25, ST, Al)

584-Q. (German.) **The Extended Evaluation of Diagrams of Chévenard Microtensile Testing Machine.** H. Hendus and H. Rohrig. *Metall,* v. 8, nos. 9-10, May 1954, p. 371-373.

Advantages in research, production control and computation of different functions. Diagrams, graphs, photograph. 5 ref. (Q27)

585-Q. (German.) **Tendency of Local Change in Solution Pressure of Metals Under Slight Stresses.** Paul Koch. *Metalloberfläche,* Ausgabe A, v. 8, no. 5, May 1954, p. 74-79.

Experimental and mathematical studies indicate that slip is probable cause. Graphs, diagram, tables. 21 ref. (Q25, P12, Cu, Al, Fe, Zn, Pt, Ag)

586-Q. (Russian.) **Influence of Surface Geometry and External Medium on Cold Shortness of Steel.** E. M. Shevandin, I. A. Razov and R. E. Reshetnikova. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 463-466.

Tests evaluate influence of surface geometry on strength and plasticity of steel under static tensile and bending stresses. Graph. 3 ref. (Q23, ST)

587-Q. (Russian.) **Mechanism of Weakening and Rupture of Crystalline Bodies as a Function of Time at High Temperature.** S. T. Kishkin. *Doklady Akademii Nauk SSSR,* v. 95, no. 4, Apr. 1, 1954, p. 789-791.

Decrease of strength, formation of cracks, strengthening and weakening of nickel and iron alloys. Graphs. 5 ref. (Q26, Ni, Fe)

588-Q. (Russian.) **Damage to Metals Under Prolonged Loads at High Temperatures** Ia. B. Fridman and B. A. Drozdovskii. *Doklady Akademii Nauk SSSR,* v. 95, no. 4, Apr. 1, 1954 p. 793-796.

Damagability curve for chromium-nickel alloy at 600° C. Graph, micrographs. 10 ref. (Q general, Cr, Ni)

589-Q. Plastic Deformation in Beams Under Distributed Dynamic Loads. J. A. Seiler and P. S. Symonds. *Journal of Applied Physics,* v. 25, May 1954, p. 556-563.

Magnitude of deformation decreases rapidly as length of loaded area increases from zero. Assumption of concentrated load may lead to overestimation of deformation. Graphs, diagrams. 6 ref. (Q24)

590-Q. Friction of Clean Metals and Oxides With Special Reference to Titanium. E. S. Machlin and W. R. Yankee. *Journal of Applied Physics,* v. 25, May 1954, p. 576-581.

Friction coefficients of freshly cut surfaces in inert atmosphere compared with values on same surfaces later exposed to air to determine factors that affect seizure and galling. Photographs, tables. 5 ref. (Q9, Ti)

591-Q. Delayed Yield and Strain Rate and Temperature Dependence of Yield Point in Iron. Takeo Yokobori. *Journal of Applied Physics,* v. 25, May 1954, p. 593-594.

Cottrell locking theory used, taking internal stress into account. Graphs, table. 13 ref. (Q23, Fe)

592-Q. An Effect Produced by Oblique Impact of a Cylinder on a Thin Target. William A. Allen, Joe M. Mapes and Wesley G. Wilson. *Journal of Applied Physics,* v. 25, May 1954, p. 675-676.

Right circular steel cylinders were fired at conventional ordnance velocities into thin plane lead targets. Micrographs. 2 ref. (Q6, Pb, ST)

593-Q. Fatigue Notch Sensitivity of Some Aluminum Alloys. J. A. Bennett and J. G. Weinberg. *Journal of Research, National Bureau of Standards,* v. 52, May 1954, p. 235-245.

Values determined for 24S-T4, 61S T6 and 76S-T6. Specimens had theoretical stress-concentration factors of 1.0, 1.4 and 1.8. Tables, graphs, micrographs, photographs. 14 ref. (Q7, Al)

594-Q. Report of Symposium on Wear and Abrasion. (Digest of "Proceedings of the International Symposium on Abrasion and Wear", *Engineering,* v. 172, Aug. 24, 1951, p. 243; Nov. 30, 1951, p. 694; Dec. 7, 1951, p. 724; Dec. 14, 1951, p. 758; Dec. 21, 1951, p. 790; Dec. 28, 1951, p. 818.) *Metal Progress,* v. 65, June 1954, p. 162, 164, 166.

Definition, presence of surface films, testing and various causes of wear. (Q9)

595-Q. Steels for High Temperatures. (Digest of "Special Steels for Gas Turbines", by W. E. Bardgett and G. R. Bolsover; *Symposium on High-Temperature Steels and Alloys for Gas Turbines, Iron and Steel Institute, Special Report No.* 43, 1952, p. 135-148.) *Metal Progress,* v. 65, June 1954, p. 154, 156.

Effects of titanium, tungsten, columbium, cobalt, molybdenum and vanadium on creep resistance. (Q3, AY)

596-Q. The Effect of Quenching Strains on the Properties of an Al-Cu-Mg Alloy. H. A. Unckel. *Metallurgia,* v. 49, no. 295, May 1954, p. 220-222.

Small plastic strains applied after quenching affect yield stress considerably. Tables. 10 ref. (Q23, J26, Al, Cu)

597-Q. Variation of Hardness of Metals with Grain Size. E. O. Hall. *Nature,* v. 173, May 15, 1954, p. 948-949.

Shows relation of grain diameter to Brinell number. Graph. 6 ref. (Q29, M27)

598-Q. The Influence of Temperature and Rate of Strain on the Properties of Metals in Torsion. Clyde E. Work and Thomas J. Dolan. *University of Illinois Bulletin, (Engineering Experiment Station Bulletin Series no. 420,)* v. 51, no. 24, Nov. 1953, 109 p.

Cylindrical specimens 0.25 in. in diameter tested at four different constant strain-rates and at four different temperatures up to 120° F. Tables, graphs, photographs, diagrams. 132 ref. (Q1, ST, Al, Mg, Ti)

599-Q. (English.) **Determination of Residual Surface Stresses With the Aid of Resistance Wire Strain Gauges.** S. Sjöström. *Applied Scientific Research,* v. 4, sec. A, no. 4, 1954, p. 305-312.

Application of method to determine residual surface stresses in a case hardening gear tooth steel. Table, graphs. 7 ref. (Q25, AY)

600-Q. (English.) **Stress Pulse in Bar With Neck or Swell.** H. C. Fischer. *Applied Scientific Research,* v. 4, sec. A, no. 4, 1954, p. 317-328.

Transmission and reflection of an elastic rectangular stress pulse. Graphs, diagrams. 16 ref. (Q21)

601-Q. (Czech.) **Economic Heat Resisting Alloys for Temperatures Above 800° C.** Jaroslav Pluhar and Miloslav Vyklicky. *Slévarenstvi,* v. 2; *Prace Ceskoslovenského Vyzkumu Slévarenskénho,* v. 1, no. 3, 1954, p. 21-28.

Heat resistance of 29 alloys of iron-silicon, iron-silicon-aluminum and iron-aluminum with various

amounts of carbon, up to 12% silicon and 33% aluminum. Steel specimens with 13 to 25% chromium and austenitic chromium-nickel steel. Specimens examined at 800 to 1100° C. Tables, graphs, micrographs. (Q general, Fe, Si, Al, AY, Cr, Ni)

602-Q. (German.) **The Poisson Constant of Metals.** *Applied Scientific Research,* v. 4, sec. A, no. 4, 1954, p. 329-336.

Accurate measurement of the Poisson ratio of 12 cubic metals. Photograph, tables. 27 ref. (Q21)

603-Q. (Book.) **A Critical Survey of Brittle Fracture in Carbon Plate Steel Structures Other Than Ships. M. E.** Shank. Welding Research Council of the Engineering Foundation, 29 West 39th St., New York 18, N. Y. $2.00.

Prepared for the National Research Council's Committee on Ship Structural Design. Problem of brittle fracture in mild steel includes water standpipes, a gas-holder, storage tanks, three Vierendeel truss bridges, other bridges, pressure vessels, power shovel booms and dipper sticks, penstock, gas transmission lines, welded steel stack, and a methane column. (Q26)

604-Q. (Book.) **The Determination of Torsion Constants for Bulbs and Fillets by Means of an Electrical Potential Analyser.** Research Report No. 22, Aluminium Development Association, 33 Grosvenor Street, London W. 1, England. 7s. 6d.

Apparatus, operation, and results for angle fillets, T-junction fillets, single and double-sided bulbs, and sections and fillets with unequal web thicknesses. (Q1, Al)

605-Q. (Book.) **Literature Survey on Weld-Metal Cracking.** Wright Air Development Center. Report No. PB 111285. 212 p. 1952. Office of Technical Services, U. S. Dept. of Commerce, Washington, D. C. $3.00.

Analysis of 800 individual papers concludes that most weld-metal cracking is interdendritic or intergranular and occurs largely at high temperatures. (Q26, K9)

606-Q. (Book—Russian.) **Contact Fatigue of the Teeth of Spur Gears. G.** K. Trubin. TsNIITMASh. Book No. 37. 150 p. Government Scientific-Technical Publishing House, Moscow.

Fundamental description of failures by wear, pitting, chipping of teeth, root fracture, and corrosion-fatigue fractures through pitted zone. Also, as affected by oil type, viscosity and rate of application. (Q26, Q9, Q7)

607-Q. Effect of Ceramic Coatings on Fatigue Strength of Metal. W. J. Plankenhorn. *American Ceramic Society, Journal,* v. 37, June 1954, p. 281-288.

Studies on ingot iron specimens of the Krouse cantilever beam type showed that ceramic coatings improved fatigue strength and fatigue life at stresses above endurance limit. Photograph, diagram, graphs, tables. 17 ref. (Q7, L27)

608-Q. The Stresses, Strain and Displacements in a Sphere. Irving Granet. *American Society of Naval Engineers, Journal,* v. 66, May 1954, p. 393-399.

Mathematical analysis. 3 ref. (Q25)

609-Q. Temperature and Hardness Distribution in Welded Al—4% Cu Alloy Sheet. L. E. Vogel, J. V. Lyons and W. I. Pumphrey. *British Welding Journal,* v. 1, June 1954, p. 252-259.

Measurements made at various positions in two sheets of an age-hardened alloy while a fusion weld was being made. Graphs. 14 ref. (Q29, K1, Cu, Al)

610-Q. Behaviour of Rolled-Steel Joists in the Plastic Range. J. W. Roderick and H. H. L. Pratley. *British Welding Journal,* v. 1, June 1954, p. 261-275.

Tested as simply supported beams bending about major axis, with either a central concentrated load or two equal loads equidistant from center. Graphs, tables, diagrams, photographs. 14 ref. (Q24, ST)

611-Q. Stress-Rupture Time Properties of Copper Tube Materials. R. S. D. Lushey and J. McKeown. *Engineer,* v. 197, June 4, 1954, p. 811-813.

Determination of highest safe stress which can be used to give long life without excessive deformation. Tables. 1 ref. (Q4, Cu)

612-Q. Symmetrically Loaded Circular Plates. M. Stippes and R. E. Beckett. *Franklin Institute, Journal,* v. 257, June 1954, p. 465-479.

Approximation procedure which only requires that slope in the corresponding linear problem be expandable in either a Fourier-Bessel or Dini series depending on nature of boundary conditions involved. Tables. (Q25)

613-Q. The Theory of Elasticity and of Wave-Propagation in Crystals From the Atomistic Standpoint. K. S. Viswanathan. *Indian Academy of Sciences, Proceedings,* v. 39, sec. A, Apr. 1954, p. 196-213.

Static method of determining strain energy function for general deformation. 11 ref. (Q21)

614-Q. Some Observations on the Deformation in Stainless Steels. M. S. Mitra and M. G. Fontana. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 137-149; disc., p. 149.

Metallographic and X-ray studies on effect of cold deformation. Micrographs, radiograms, table. 21 ref. (Q24, M27, SS)

615-Q. Effect of Wire Drawing on the True Stress-Strain Curve. M. S. Mitra and M. G. Fontana. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 170-191; disc., p. 191-192.

Effect of prestrain and other characteristics on 17-Cr, 18-8 and 18-11 Cr-Ni, stainless steels and SAE 1020 carbon steel. Tables, graphs. 22 ref. (Q27, F28, SS, CN)

616-Q. Studies on the Relation Between Some Static and Dynamic Properties of Carbon Steels Under Different Thermal Treatments. S. Chatterjee and G. P. Chatterjee. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 193-201; disc., p. 201-202.

Nature of relation between area under stress-strain curve, toughness and Izod values. Tables, graphs. (Q27, Q6, CN)

617-Q. Some Studies on Hardness and Work-Hardenabilities of Metals and Alloys. G. P. Chatterjee. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 219-229; disc., p. 229-232.

Concept of hardness in terms of work done per unit volume of indentation. Compares values with Brinell hardness numbers. Graphs. 4 ref. (Q29)

618-Q. Effects of Anodic Surcharging on the Behaviour of Some Plain Carbon Steel. G. P. Chatterjee, K. C. Som and R. Ganguly. *Indian Institute of Metals, Transactions,* v. 6, 1952, p. 233-241; disc., p. 242.

Effects of anodic passivation at high current density in dilute sulfuric acid and subsequent aging on hardness values. Graphs, tables. (Q29, R10, CN)

619-Q. Metallographic Observations on Cell Formation and Development in Aluminium. J. W. Kelly and R. C. Gifkins. *Institute of Metals, Journal,* v. 82, June 1954, p. 475-480 + 4 plates.

Cell formation from kink and deformation bands in many grains, at various rates at temperatures up to 300° C. Micrographs, tables. 38 ref. (Q24, M27, Al)

620-Q. Some Observations on the Deformation of Zinc at High Temperatures. R. W. Cahn, I. J. Bear and R. L. Bell. *Institute of Metals, Journal,* v. 82, June 1954, p. 481-489 + 2 plates.

Micro-beam X-ray diffraction technique for determining orientation relationships between neighboring units of substructure. Causes and mechanism of cell development. Diagrams, micrographs, tables. 35 ref. (Q24, M22, Zn)

621-Q. How Heat Treating Improves Modern High Strength Irons. C. R. Austin. *Iron Age,* v. 173, June 10, 1954, p. 125-129.

Variation of properties with different heat treatments. Tables, graphs, photograph. (Q general, J general, CI)

622-Q. Stresses in a Metal Tube Under Both High Radial Temperature Variation and Internal Pressure. Chieh-Chien Chang and Wen-Hwa Chu. *Journal of Applied Mechanics,* v. 21, June 1954, p. 101-108.

Fundamental equations formed with temperature distribution across tube wall and variations of modulus of elasticity and coefficient of thermal expansion obtained from experimental data. Graphs. 7 ref. (Q21, P11)

623-Q. Plastic Flow in a Rectangularly Notched Bar Subjected to Tension. E. H. Lee. *Journal of Applied Mechanics,* v. 21, June 1954, p. 140-146.

Initial motion based on undeformed boundaries and subsequent flow including deformation of notch boundaries. Diagrams. 16 ref. (Q24, Q27)

624-Q. Comparison of the Hardening Produced in a Yield-Point Steel by Uniaxial Loading Under Static and Under Dynamic Conditions. D. H. Harris and M. P. White. *Journal of Applied Mechanics,* v. 21, June 1954, p. 194-195.

Plastic straining under longitudinal impact causes more severe working and greater hardening in annealed mild steel than does an equal static strain. 2 ref. (Q28)

625-Q. Creep Rupture Properties and Structural Changes in Carbon and Low Alloy Steels. A. B. Wilder, E. F. Ketterer and D. B. Collyer. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, June 1954, p. 764-772.

Microstructural stability after 34,000 hr. exposure at 900 and 1050° F. Tensile and creep rupture properties

before and after 10,000 hr. exposure. Diagrams, tables, micrographs. 7 ref. (Q3, Q4, CN, AY)

626-Q. Stress Analysis in Design. III. Experimental Methods. J. B. Hartman and R. E. Benner. *Machine Design,* v. 26, June 1954, p. 144-150.

Photo-elasticity, strain gages, brittle lacquers and analogies. Photographs, diagrams. 4 ref. (Q25)

627-Q. On the Effect of Change in Deformation Rate on Plastic Deformation. L. I. Vasilyev, A. S. Bylina and M. P. Zagrebennikova. *National Science Foundation Translation, no.* 138, Dec. 1953, 3 p. (From *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 767-769.)

Previously abstracted from original. See item 117-Q, 1954. (Q24, Cu, Sn)

628-Q. The Role of Grain Boundaries in the Plastic Deformation of Aluminum. E. S. Yakovleva and M. V. Yakutovich. *National Science Foundation Translation, no.* 155, Jan. 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 1027-1029.)

Previously abstracted from original. See item 119-Q, 1954. (Q24, Al)

629-Q. Lattice Imperfections and Plastic Deformation in Metals. II. Behaviour of Lattice Imperfections During Deformation. H. G. van Bueren. *Philips Technical Review,* v. 15, Apr. 1954, p. 286-295.

Phenomena of practical importance in work hardening, aging of alloys and variations of electrical resistance. Micrographs, graphs. 24 ref. (Q24, P15, M26, N7)

630-Q. The Markings in the Cleavage Surfaces of Zinc Single Crystals. A. Deruyttere and G. B. Greenough. *Philosophical Magazine,* v. 45, 7th ser., no. 365, June 1954, p. 624-630.

Crystals of various orientations broken by applied tensile stresses at −196° C. Two faces of the cleavage fracture differed markedly. Diagrams. 7 ref. (Q26, Zn)

631-Q. The Formation of Twins by a Moving Crack. B. A. Bilby and R. Bullough. *Philosophical Magazine,* v. 45, 7th ser., no. 365, June 1954, p. 631-646.

Theory applied in detail to twinning and certain other features of the deformation associated with cleavage fracture of zinc single crystals. Charts. 12 ref. (Q24, Q26, Zn)

632-Q. Fatigue Testing Fixtures. T. R. Breunich. *Product Engineering,* v. 25, June 1954, p. 200-205.

Types, design information, applications of methods for material and simulated service testing. Tables, photographs. (Q7)

633-Q. Strength of Cast Alloys at 1,200° F. Joseph R. Lane. *Product Engineering,* v. 25, June 1954, p. 207, 209, 211.

Reference data sheet on alloys which are unmachinable or intricately shaped. Tables. 7 ref. (Q23, Fe, Mo, W, Mn, Ti, V, Cb, Al)

634-Q. An Apparatus for the Accurate Measurement of Internal Friction. John R. Pattison. *Review of Scientific Instruments,* v. 25, May 1954, p. 490-496.

Electronic instrument developed for measurement of internal friction to high level of accuracy. Diagrams. 6 ref. (Q22)

635-Q. Effects of Residual Stress on Fatigue Life of Metals. R. L. Mattson. *Steel Processing,* v. 40, June 1954, p. 365-375, 390.

Common causes of internal stresses, measurement and consequences of their existence. Graphs, tables, diagram, micrographs. 10 ref. (Q25, Q7)

636-Q. Tensile Properties of Pure Chromium at Elevated Temperature. H. A. Johansen, H. L. Gilbert, R. G. Nelson and R. L. Carpenter. *U. S. Bureau of Mines, Report of Investigations* 5058, May 1954, 8 p. + 4 plates.

Mechanical properties at temperatures to 800° C. under different pressures. Photographs, graphs, tables, micrographs. 16 ref. (Q23, Cr)

637-Q. A Special Investigation to Develop a General Method for Three-Dimensional Photoelastic Stress Analysis. M. M. Frocht and R. Guernsey, Jr. *U. S. National Advisory Committee for Aeronautics, Report* 1148, 1953, 17 p.

Method for determination of principal stresses at any point of a body subjected to arbitrary loads. Diagrams, photographs, stress patterns, graphs, tables. 19 ref. (Q25)

638-Q. Buckling of Long Square Tubes in Combined Compression and Torsion and Comparison With Flat-Plate Buckling Theories. Roger W. Peters. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3184, May 1954, 15 p.

Compares predictions of theories for buckling of long flat plates with results of elastic and plastic buckling tests on long square tubes. Graphs, photograph, table. 14 ref. (Q28, Q1, Al)

639-Q. Statistical Study of Overstressing in Steel. G. E. Dieter, G. T. Horne and R. F. Mehl. *U. S. National Advisory Committee for Aer-*

onautics, Technical Note 3211, Apr. 1954, 34 p.

Effect of microstructure on susceptibility to reduction in fatigue life due to cycles of overstress. Graphs, micrographs, tables. 29 ref. (Q7, M27, ST)

640-Q. **Fatigue as a Factor in Pressure Vessel Design.** T. J. Dolan. *Welding Journal,* v. 33, June 1954, p. 265S-275S.

Factors influencing fatigue strength of metal members from viewpoint of applicability to design of pressure vessels. Photograph, diagrams, graphs. 48 ref. (Q7)

641-Q. **Fatigue Tests of Steel Specimens Prepared for Metallizing.** R. C. Miller, Jr., and A. W. Brunot. *Welding Journal,* v. 33, June 1954, p. 275S-279S.

Laboratory tests show extent to which preparation for metallizing lowers fatigue strength of steel shafts. Tables, diagrams, photographs. (Q7, L23, ST)

642-Q. **The Effect of Grain Boundaries on Mechanical Properties.** M. Gensamer. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 16-29.

Crystallographic translation predominates at low temperatures and high speeds of deformation, whereas grain boundary shear predominates at elevated temperatures and slow speeds. Impurities play a large role in determining the effectiveness of grain boundaries in limiting ductility. Graphs, photographs. 27 ref. (Q23, M27)

643-Q. **Effect of Dispersions on Mechanical Properties.** John E. Dorn and C. Dean Starr. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 71-94.

Deformation processes occurring in alloys composed of several ductile phases viewed as simple extension of processes that occur in single-phase polycrystalline aggregates. Graphs, table. 33 ref. (Q24, M27)

644-Q. **Structure and Alloy Design.** A. D. Schwope. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 108-130.

Effects of alloying and subsequent structure on strength. Deformation mechanisms. Strength of solid solutions. Tables, graphs. 33 ref. (Q23, Q24, M27)

645-Q. **The Relation of Microstructure to Brittle Fracture.** J. R. Low, Jr. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 163-179.

Modes of brittle fracture, origin of flaws, crack propagation and intercrystalline cleavage fracture. Micrographs, graphs. 19 ref. (Q26, M27, CN)

646-Q. (English.) **Stress and Deflection Measurements on a Multicell Cantilever Box Beam With 30° Sweep.** Sigge Eggwertz and Bryan R. Noton. *Aeronautical Research Institute of Sweden, Report no.* 53, 1954, 30 p.

Stress distributions in model and deflections of outer-most spars determined for two symmetrical loading cases. Graphs, diagrams, photographs, tables. (Q25, Al)

647-Q. (English.) **Calculation of Stresses in a Swept Multicell Cantilever Box Beam With Ribs Perpendicular to the Spars and Comparison With Test Results.** Sigge Eggwertz. *Aeronautical Research Institute of Sweden, Report no.* 54, 1954, 43 p.

Calculated stresses compared to test results from a glued aluminum alloy model wing. Longitudinal normal stress distribution agrees very well with experimental values, while there is a certain discrepancy for the shear stresses. Tables, diagrams, graphs. 18 ref. (Q25, Al)

648-Q. (English.) **The Size Effect in Fatigue of Notched Steel Specimens Loaded Under Reversed Direct Stress.** Akira Hikata. *Government Mechanical Laboratory, Japan, Bulletin,* 1954, no. 2, 8 p.

Tests in direct stress machines to avoid stress gradient across sections of specimens due to bending. Tables, graphs, diagrams, photographs. 4 ref. (Q7, ST)

649-Q. (French.) **Atomic Theory of Crystalline Elasticity Excluding Central Forces.** Jean Laval. *Comptes rendus,* v. 238, no. 18, May 3, 1954, p. 1773-1775.

Stresses developed on reticular planes by linear deformation. 3 ref. (Q21)

650-Q. (French.) **The Influence of Gases on the Mechanical Properties and Imperviousness of Bronzes. Oxidizing or Reduction Fusion; Oxidizing Flux Treatment; and Bubbling of Hydrogen, Nitrogen, and Dry or Moist Air.** Georges Blanc. *Fonderie,* 1954, Apr., no. 99, p. 3897-3909.

Three bronze alloys tested. Diagram, photographs, micrographs, tables. 26 ref. (Q general, Cu, Sn, Pb, Zn)

651-Q. (French.) **Titanium and Vanadium in Cast Iron.** *Fonderie,* 1954, Apr., no. 99, p. 3910-3913.

Influence on corrosion resistance and mechanical properties. Table. 8 ref. (Q general, R general, CI)

652-Q. (French.) **Research on Silicon in Tin Bronzes.** *Fonderie,* 1954, Apr., no. 99, p. 3915-3917.

Effect of introduction of poorly cleaned foundry scrap on mechanical properties. Tables. (Q general, E general, Cu)

653-Q. (French.) **Standard for Preparation of A-U4 NT.** *Fonderie,* 1954, May, no. 100, p. 3952-3955.

Mechanical properties of aluminum-copper-nickel-magnesium alloy. Tables. (Q general, Al, Cu)

654-Q. (French.) **Shock Fatigue of a Steel Part: Calculation of a Bloom-Shear Stop.** L. Gascuel. *Métallurgie et la construction mécanique,* v. 86, no. 5, May 1954, p. 415-417.

Practical method of evaluating shock reactions. Diagrams, photograph. (Q6, ST)

655-Q. (French.) **Industrial Research on Boron Steels.** Third Report of the I.R.S.I.D. Committee for the Study of Boron Steel. G. Delbert and A. Kohn. *Revue de métallurgie,* v. 51, no. 5, May 1954, p. 337-362; disc., p. 362-363.

Effects on hardenability and other mechanical properties. Tables, graphs, diagram. 6 ref. (Q general, J26, AY)

656-Q. (Russian.) **Influence of Decomposition of Supersaturated Solid Solution Induced by Plastic Deformation on Mechanical Properties of Aluminum-Copper Alloy.** V. A. Pavlov. *Doklady Akademii Nauk SSSR,* v. 95, no. 6, Apr. 21, 1954, p. 1201-1203.

Temperature dependence of mechanical properties of pure aluminum and aluminum-copper alloy. Graphs. 13 ref. (Q general, Al)

657-Q. (Russian.) **Carrying Capacity and Strength Calculations for Parts Under Static and Variable Stresses.** S. V. Serensen. *Vestnik Mashinostroeniia,* v. 34, no. 4, Apr. 1954, p. 3-10.

Hypothesis for forged structural steel. Table, graphs. 10 ref. (Q25, ST)

658-Q. (Russian.) **Strength of Metals and Effect of Stress Concentration in Bending With Torsion in Conditions of Nonsymmetrical Cycles of Alternating Load.** G. V. Uzhik. *Vestnik Mashinostroeniia,* v. 34, no. 4, Apr. 1954, p. 11-14.

Formula for fatigue limit. Tables, graphs, photographs. 4 ref. (Q7)

659-Q. (Russian.) **Effect of Nitriding on Erosion Properties of Low Alloyed Steel Used for Steam Power Equipment Parts.** A. D. Moiseev. *Vestnik Mashinostroeniia,* v. 34, no. 4, Apr. 1954, p. 61-65.

Negative results on three types of steel alloys. Tables, graphs, micrographs. 2 ref. (Q9, J28, AY)

660-Q. (Swedish.) **The Nature of Hydrogen Embrittlement.** F. de Kazinczy. *Jernkontorets Annaler,* v. 138, no. 5, 1954, p. 271-287.

Molecular hydrogen of high pressure included in cracks initiates fracturing and explains phenomenon. Graphs. 21 ref. (Q23, Q26, ST)

661-Q. Flexure-Torsion Failure of Panels. John H. Argyris. *Aircraft Engineering,* v. 26, June 1954, p. 174-184.

Investigates single skin panels. Instability mainly involves bending and torsion of the stringer. Tables, diagrams, graphs. 9 ref. (To be continued.) (Q1, Q5)

662-Q. Vanadium and Molybdenum in Medium Manganese Cast Steel. Charles C. Spencer. *American Foundryman,* v. 26, July 1954, p. 45-47.

Comparison of properties of medium manganese, manganese-vanadium and manganese-molybdenum cast steels. Manganese-vanadium steels containing 0.10% vanadium were equivalent to the manganese-molybdenum steels containing 0.30% molybdenum with regard to mechanical properties and hardenability. Micrographs, graphs, tables, photograph. (Q general, J26, CI)

663-Q. Brittle Fracture of a Crane Hook. *British Engine, Boiler & Electrical Insurance Co. Ltd., Technical Report,* New ser., v. I, Nov. 1952, p. 130-138.

Failure attributed to strain-age embrittlement. Photographs, diagrams, micrographs. (Q23, Q26)

664-Q. Some Sources of Error in Quasi-Static and Impact Notched-Bar Testing. G. A. Cottrell. *British Engine, Boiler & Electrical Insurance Co. Ltd., Technical Report,* New ser., v. I, Nov. 1952, p. 182-212.

Analysis of specimens, procedures and equipment. Photographs, graphs, diagrams. Tables. 20 ref. (Q6)

665-Q. Testing Machine for Large Structures. Application of Static and Dynamic Loads. *Engineering,* v. 177, June 11, 1954, p. 750-753.

Description of Belgian universal testing machine. Photographs, diagrams. (Q27)

666-Q. Temperature Stresses in Iron Work Rolls. Charles F. Peck, Jr., Juan M. Bonetti and Frederic T.

Mavis. *Iron and Steel Engineer,* v. 31, June 1954, p. 45-57; disc., p. 57-58.

Analysis based on computed temperature distribution shows stresses which play an important part in explanation of spall faliures. Diagrams, graphs, tables. (Q25, F23, CI)

667-Q. Hardness Plateaus and Twinning in Explosively Loaded Mild Steel. John Pearson and John S. Rinehart. *Journal of Applied Physics,* v. 25, June 1954, p. 778-781.

Degree of work hardening in the cylinder wall decreased nonuniformly with an increase in distance from the surface in contact with the explosive. Graphs, diagram, micrographs. 7 ref. (Q29, ST)

668-Q. On the Rotation of Grid Lines Produced by the Formation of Plastic Bands in Tension Tests. T. Y. Thomas. *National Academy of Sciences of the United States of America, Proceedings,* v. 40, June 1954, p. 401-407.

Mathematical treatment of local deformation. Diagrams, table. 3 ref. (Q27)

669-Q. Resistance of Metals to Plastic Deformation. Yu. I. Yagn and I. A. Chaplinsky. *National Science Foundation Translation, no.* 176, Jan. 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 90, 1953, p. 1023-1026.)

Previously abstracted from original. See item 118-Q, 1954. (Q24, Fe, Cn, AY, Al)

670-Q. Effect of the Ratio of Rubbing Surface to Hardness on Slipping Conditions of Machine Parts in Contact. D. N. Garkunov and I. V. Kragelsky. *National Science Foundation Translation, no.* 178, Jan. 1954, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 91, 1953, p. 1085-1088.)

Previously abstracted from original. See item 94-Q, 1954. (Q9, Al, Cu, ST, CN)

671-Q. Elliptic Elastic Inclusion in an Infinite Elastic Plate. N. Jessie Hardiman. *Quarterly Journal of Mechanics and Applied Mathematics,* v. 7, June 1954, p. 226-230.

Constant stresses at infinity in an elastic plate containing an elliptic inclusion of different material induce consant stresses in the elliptic inclusion. Diagrams. 3 ref. (Q25, Q21)

672-Q. High Temperaure Strain Gages. Alvin B. Kaufman. *Radio & Television News, Radio-Electronic Engineering Section,* v. 22, May 1954, p. 12-13, 38-39.

By use of ceramic bonding, properly designed strain gages may be operated at temperatures up to 2000° F. Photographs, diagram, table, graphs. 3 ref. (Q25)

673-Q. The Estimation of Fatigue Damage in Aircraft Wing Structures. A. H. Chilver. *Royal Aeronautical Society, Journal,* v. 58, June 1954, p. 396-402.

Endurance of typical structural components when subjected to alternating wing loads encountered by aircraft in flight. Graphs, tables. 8 ref. (Q7)

674-Q. Recent Developments in the Structural Approach to Aeroelastic Problems. D. Williams. *Royal Aeronautical Society, Journal,* v. 58, June 1954, p. 403-421; disc., p. 421-428.

Application of electronic computer to stress analysis of aircraft. Equations suitable for mechanical computation. Graphs. 11 ref. (Q25)

675-Q. X-Ray Diffraction Takes a Fresh Look at Yield Point in Metals. Norman P. Goss. *Steel,* v. 135, July 5, 1954, p. 78-79.

Produces a clear picture of deformation mechanics. Photographs, diagrams. 2 ref. (Q23, M22, Cu, Be)

676-Q. Time-Temperature Parameters and an Application to Rupture and Creep of Aluminum Alloys. George J. Heimerl. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3195, June 1954, 35 p.

Parameter for predicting longtime life from short-time creep and rupture data for aluminum and its alloys. Graphs, table. 15 ref. (Q4, Q3, Al)

677-Q. Behavior of Steels Exposed to Hydrogen Under High Pressure. (Part I of "Constructional Materials for High-Pressure Syntheses".) O. van Rossum. *Henry Brutcher, Altadena, Calif., Translation no.* 3254, 10 p. (Part from *Chemie-Ingenieur-Technik,* v. 25, nos. 8-9, 1953, p. 481-484.)

Changes caused by exposure of low-alloy heat treating steels for 2000 to 3000 hr. at 700 atmospheres pressure and temperatures up to 1040° F. Graph, photograph, micrographs. (Q general, AY)

678-Q. Poisson's Ratio of Aircraft Sheet Materials for Large Strains. Stanley Goodman and Stanton B. Russell. Paper from "The First Midwestern Conference on Solid Mechanics, Proceedings". University of Illinois, Engineering Experiment Station, p. 1-4.

Data for three aluminum alloys, one magnesium alloy, commercially pure titanium and one titanium alloy. Graphs, 5 ref. (Q21, Al, Ti)

679-Q. The Propagation of Pulses in Cylindrical Bars—an Experimental

Study. E. A. Ripperger. Paper from "The First Midwestern Conference on Solid Mechanics, Proceedings". University of Illinois, Engineering Experiment Station, p. 29-39.

Techniques and experimental data on velocity of elastic waves in drill rod. Diagrams, tables. 16 ref. (Q21, TS)

680-Q. Curvilinear Co-Ordinates for the Numerical Solution of a Notched Bar in Tension. E. D'Appolonia. Paper from "The First Midwestern Conference on Solid Mechanics, Proceedings". University of Illinois, Engineering Experiment Station, p. 60-65.

Theoretical development. Graphs, tables. 5 ref. (Q27)

681-Q. Some Problems Connected With Propagation of Stresses Above Yield Stress in a Material Exhibiting a Strain-Rate Effect. R. J. Rubin. Paper from "The First Midwestern Conference on Solid Mechanics, Proceedings". University of Illinois, Engineering Experiment Station, p. 133-135.

Equations for pulse velocity in a semi-infinite rod. 9 ref. (Q27)

682-Q. A Geometrical Construction for Plastic Flow With Work Hardening. E. H. Lee. Paper from "The First Midwestern Conference on Solid Mechanics, Proceedings". University of Illinois, Engineering Experiment Station, p. 136-140.

Theoretical development. Graphs. 8 ref. (Q24)

683-Q. On the Time Lag of Plastic Deformation. C. Riparbelli. Paper from "The First Midwestern Conference on Solid Mechanics, Proceedings". University of Illinois, Engineering Experiment Station, p. 148-157.

Relations between stress, strain and velocity in copper bar subjected to longitudinal impact. Graphs, oscillograms, diagrams. 10 ref. (Q24, Q6, Cu)

684-Q. An Experimental Investigation of the Creep Properties of Aluminum at Elevated Temperatures. R. L. Carlson and A. D. Schwope. Paper from "The First Midwestern Conference on Solid Mechanics, Proceedings". University of Illinois, Engineering Experiment Station, p. 180-183.

Behavior of 24S-T4 aluminum columns of four slenderness ratios. Graphs, photograph. (Q3, Al)

685-Q. Behavior of Perfect Columns at Elevated Temperatures. R. L. Carlson. Paper from "The First Midwestern Conference on Solid Mechanics, Proceedings". University of Illinois, Engineering Experiment Station, p. 184-185.

A straight axially loaded column will become unstable under loads less than the tangent modulus only if creep or metallurgical change effects the static stress-strain properties. Graphs. 2 ref. (Q28)

686-Q. Stresses in Columns With Time Dependent Elasticity. T. H. Lin. Paper from "The First Midwestern Conference on Solid Mechanics, Proceedings". University of Illinois, Engineering Experiment Station, p. 196-199.

Calculation of stresses and deflections. Results compared with experimental data. Graphs, diagram. 9 ref. (Q28)

687-Q. Testing for Wear Resistance. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 4-9.

Criteria of good wear tests, statistical evaluation of data, properties affecting wear resistance. Graph. 3 ref. (Q9)

688-Q. Selecting Materials for Wear Resistance. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 10-40.

Factors influencing wear including heat, impact, corrosion, vibration and fatigue and materials selection based on wear analysis. Tables, graphs, photographs, diagrams. 16 ref. (Q9)

689-Q. Martensitic Irons. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 202-214.

Propertis and structure of wear resistant alloy cast irons. Photograph, micrographs, graphs, table. 5 ref. (Q9, M27, CI)

690-Q. Cobalt-Base Alloys. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 215-224.

Mechanical properties of stellite-type hard-facing alloys. Tables, graphs, micrographs. 5 ref. (Q9, L24, Co)

691-Q. Nickel-Base Alloys. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 225-230.

Composition and properties of alloys suitable for hard facing materials. Graph, tables. 6 ref. (Q9, L24, Ni)

692-Q. Martensitic and Pearlitic Steels. Howard S. Avery. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 231-250.

Abrasion resistance and hardness of steels for hard-facing applications. Methods for producing martensitic structure. 17 ref. (Q9, Q29, L24, CN, AY, SS, TS)

693-Q. Developments Necessary for General Theories of Creep Useful in Stress Analysis. K. R. Merckx. Paper presented at Pacific Northwest Metals and Minerals Conference of the A.I.M.E., 1954, Portland, Ore. 14 p. + 2 plates.

Includes graphs. 14 ref. (Q25, Q3)

694-Q. (English.) **The Slip Process During Yield-Point Deformation.** Edward W. Hart. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 416-418.

Effect of changed yield stress on production of a slip burst. Graphs. 4 ref. (Q27)

695-Q. (English.) **Residual Lattice Strains in Plastically Deformed Aluminium.** Catherine M. Bateman. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 451-455.

Residual lattice strains in three types of aluminum using X-ray diffraction methods; compared quantitatively with the theory of an intergranular stress system. Tables, graphs. 8 ref. (Q24, M22, Al)

696-Q. (English.) **Some Observations on the Anelastic Properties of Copper and Tin Bronzes.** K. J. Marsh. *Acta Metallurgica,* v. 2, no. 3, May 1954, p. 530-545.

Damping curves obtained at two frequencies, and peak damping, peak temperature and activation energy compared with results of impact-tensile tests on the same materials. Diagram, graphs, tables. 5 ref. (Q22, Q6, Q8, Cu, Sn)

697-Q. (English.) **On a New Capacitance-Type Strain Meter.** Ken Ikeda and Bunji Tomita. *Institute of Industrial Science, Report, (University of Tokyo),* v. 3, no. 7, Mar. 1954, p. 249-267.

Development of strain gages and electrical system, calibration and factors affecting accuracy. Photographs, diagrams, graphs. 8 ref. (Q25)

698-Q. (Dutch.) **Copper and Copper Alloys. XIII.** (Brass.) W. G. D. De Jager. *Metalen,* v. 9, no. 9, May 15, 1954, p. 145-146.

Tensile and fatigue strength with different treatment of various zinc and copper mixtures. Tables. (To be continued) (Q23, Q7, Cu, Zn)

699-Q. (French.) **The Polygonization of Pure Iron.** Jean Talbot, Christian de Beaulieu and Georges Chaudron. *Comptes rendus,* v. 238, no. 22, May 31, 1954, p. 2162-2165.

Structural effects of recovery after slight deformation. Micrographs, radiographs. 3 ref. (Q24, Fe)

700-Q. (French.) **Adaptation and Plastic Stabilization Tests on Rolled Structural Beams.** Charles Massonnet. *Ossature métallique,* v. 19, no. 6, June 1954, p. 318-328.

Equalization phenomena in plastic deformation for increased load limits of steel. Diagrams, photographs, tables, graphs. 6 ref. (Q24, ST)

701-Q. (German.) **Effect of Size and Hardening Temperature on Hardness and Toughness of Case-Hardened Steels.** Heinz Kiessler and Ernst Kunze. *Stahl und Eisen,* v. 74, no. 12, June 3, 1954, p. 768-772.

Frequency curves of hardness tests on manganese-chromium and chromium-nickel steels. Graphs, tables. 3 ref. (Q29, Mn, Cr, Ni, SS)

702-Q. (German.) **After Effect Theory of Elastic Relaxation.** J. Meixner. *Zeitschrift für angewandte Physik,* v. 6, no. 5, May 1954, p. 215-217.

Stress-strain relation in isotropic medium may be transformed into hydrostatic and shear components. Corresponding transformation may be made for crystals. 7 ref. (Q21)

703-Q. (Italian.) **Increasing Elastic Limit of Steels in Construction of Fuel Pipes From Tubes With Reinforced Rings and Superstressed Tubes.** M. G. Ferrand. *Industria Mecanica,* v. 6, no. 3, Mar. 1954, p. 119-131.

Construction principles, mechanical properties. Tables, diagrams, graphs. (Q21, ST)

704-Q. (Polish.) **Tests on the Effect of Technological Process Upon the Mechanical Properties of Znal 41 Strips.** S. Socha. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 2, 1954, p. 74-82.

Strip from semi-continuous ingots of zinc-4% Al-1% Cu cast showed good plastic properties. Tables, graphs, micrographs. 9 ref. (Q23, Al, Ni)

705-Q. (Russian.) **Effect of Surface-Active Substances and Oxide Films on the Deformation Process of Monocrystals of Cadmium.** V. S. Ostrovskii and V. I. Likhtman. *Doklady Akademii Nauk SSSR,* v. 96, no. 2, May 11, 1954, p. 319-321.

Effect studied in solutions of oleic acid in isooctane and n-butyl alco-

hol in water at optimal concentrations. Graphs. 12 ref. (Q24, Cd)

706-Q. (Russian.) **The Theory of Flow of Plastic Substances Along Surfaces.** A. A. Il'iushin. *Prikladnaia Matematika i Mekhanika,* v. 18, no. 3, May-June 1954, p. 265-288.

Calculation of plastic flow of thin-walled shells subject to pressure forming. Diagrams. 2 ref. (Q23, G general)

707-Q. The Influence of Oxygen, Nitrogen, and Carbon on the Mechanical Properties and Microstructure of Titanium. O. Z. Rylski and H. V. Kinsey. *Canadian Journal of Technology,* v. 32, July 1954, p. 146-150 + 1 plate.

Titanium containing as much as 0.25% oxygen, 0.15% carbon, 0.08% nitrogen, and about 0.35% combined iron and aluminum possesses acceptable mechanical properties. Maximum limit on these impurities before a serious deterioration of properties occurs is 0.32% oxygen, 0.18% carbon, 0.10% nitrogen and 0.40% combined iron and aluminum. Tables, graphs, photograph, and micrographs. 6 ref. (Q general, M27, Ti)

708-Q. Reinforced Holes in Plates. Raymond Hicks. *Engineering,* v. 177, June 25, 1954, p. 811-812.

Analysis of stresses and determination of reinforcing required. Diagram. (Q25)

709-Q. Measuring Loads in Wires. N. W. B. Clarke. *Engineering,* v. 177, June 25, 1954, p. 812-815.

Methods of eliminating errors in measuring prestressing loads in concrete beams. Photographs, diagrams. (Q27)

710-Q. Effect of Titanium in Steel. Parvez Mehta. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 111-138; disc., p. 138-140.

Influence of titanium contents of up to 0.6% on the structure and properties of medium carbon-manganese and low carbon-nitrogen steels. Macrographs, sulfur prints, micrographs, graphs, tables. (Q general, M27, CN, AY)

711-Q. The Structure of Cold Worked Steels. E. G. Ramachandran. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 187-213; disc., p. 214.

Effects of cold work on mechanical and physical properties. Diagrams, graphs, table. 15 ref. (Q general, P general, ST)

712-Q. Hardness and Work-Hardenability of Metals and Alloys. G. P. Chatterjee. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 245-257; disc., p. 257-259.

Analysis of hardness testing. Effect of work hardenability on test values. Graphs, diagrams, tables. 6 ref. (Q29)

713-Q. Rate of Work-Hardening of Some Aluminum-Copper Alloys. G. P. Chatterjee, K. C. Shome and R. Ganguly. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 261-269; disc., p. 269.

Effect of copper on rate of work hardening of aluminum. Graphs, tables. 5 ref. (Q29, Al, Cu)

714-Q. The Influence of Wear-Product in Accelerating Wear. M. S. Mitra and L. R. Vaidyanath. *Indian Institute of Metals, Transactions,* v. 5, 1951, p. 295-309.

Wear due to rolling friction studied under dry conditions. Table, photographs, graphs. 13 ref. (Q9)

715-Q. G-Modulus Temperature Coefficient for Beryllium Copper Wire. John T. Richards. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, July 1954, p. 827-828.

Thermoelastic characteristics. Table, graphs. 4 ref. (Q21, Cu)

716-Q. Drop Weight Test Measures Notch Ductility. W. S. Pellini, G. A. Sandoz and H. F. Bishop. *Iron Age,* v. 174, July 8, 1954, p. 100-103.

Simple method for measuring notch ductility of nodular cast irons. Diagrams, graphs, photographs. (Q23, CI)

717-Q. Control and Programming of a 200,000-Pound Fatigue Machine. H. C. Roberts and V. J. McDonald. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 1-10.

Application of control system to lever-type machine. Diagrams, graphs, photographs. 4 ref. (Q7)

718-Q. Simplified Measurement of Residual Stresses. J. L. Waisman and A. Phillips. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 29-44.

Rapid, accurate technique for measuring residual stress gradient developed in plates by various manufacturing operations. Diagrams, photograph, graphs. 7 ref. (Q25)

719-Q. Network Representation of Elastic Problems in Cylindrical Coordinates. W. A. Gross and W. W. Soroka. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 45-58.

Equivalent circuits developed by

Gabriel Kron to represent partial differential equations of the theory of elasticity extended to the three-dimensional problem in cylindrical coordinates. Tables, diagrams, graphs. 8 ref. (Q21, Q25)

720-Q. Experimental Stress Determination Within a Metal During Plastic Flow. E. G. Thomsen and J. T. Lapsley, Jr. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 59-68.

Graphical method permits calçulation of stress distribution within plastic zone of a metal. Diagrams, photograph, graphs. (Q25, Q24)

721-Q. Theory and Techniques of Calibration for Structural Flight Load Measurement. L. Rogin. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 69-80.

General approach to problem of evaluating flight loads imposed on aircraft structural components by means of measured strains in the structure. Diagrams, tables. 8 ref. (Q25)

722-Q. Plastic Models for Vibration Analysis. G. O. Sankey. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 81-90.

Demonstrates feasibility of using conveniently scaled plastic models to predict dynamic response of complex structures, particularly those of critical frequencies and mode shapes. Diagrams, photographs, tables, graphs. (Q9)

723-Q. A New Dynamic Creep Testing Machine. Y. H. Pao and J. Marin. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 107-114.

A 4-unit creep testing machine in which a specimen may be subjected to a fluctuating load consisting of a mean static load and an alternating load. Diagrams, graphs, photographs. 4 ref. (Q3)

724-Q. The Prediction of Dynamic Performance of Full-Scale Gun Turrets From Static Tests of Small-Scale Models. E. Wenk, Jr. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 115-132.

Truss-type gun girder checked for structural strength by static tests of a 1/10-scale model, and later by static and dynamic tests of a full-scale pilot turret and by shipboard firing trials. Results analyzed to determine accuracy of prediction of small-scale models. Photographs, diagrams, graphs, table. (Q general)

725-Q. Photoelastic Analysis of Reinforced Stress Raisers. J. B. Mantle. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 161-172.

Observation of manner in which circumferential stresses at a reinforced hole in a tension member varied through the member with different cross-sectional shapes of reinforcing rings. Diagrams, photographs, graphs, table. 3 ref. (Q25)

726-Q. Improved Brittle Coatings for Use Under Widely Varying Temperature Conditions. F. N. Singdale. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 173-178.

Vitreous enamels as stress indicators. Photographs. (Q25)

727-Q. Stress Concentration Factors for a Single Notch in a Flat Bar in Pure and Central Bending. M. M. Leven and M. M. Frocht. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 179-184.

Determination by photo-elastic methods. Graphs, stress patterns. 6 ref. (Q25)

728-Q. Relation Between Stress Analysis and Fatigue of Metals. R. E. Peterson. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 199-206.

Prediction of fatigue failures by determination of stress distribution patterns. Photographs, diagrams, graphs. 11 ref. (Q25, Q7)

729-Q. Interpretation of Creep and Long-Time Test Data. J. Marin. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 207-212.

Interpretation to determine working stresses. Graphs, tables. 8 ref. (Q3)

730-Q. High Temperature Test Data. A. W. Brunot. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 213-216.

Problems in tensile testing at elevated temperatures. Effects of vibrations. (Q23)

731-Q. Engineering Data Sheet No. 166. Approximate Shear Strengths of Aluminum Fillet Welds. *Welding Engineer,* v. 39, July 1954, p. 47.

Graphs for 2S, 43S, 52S, 54S aluminum. (Q2, Al)

732-Q. (German.) **The Strain Gage Method. III. Handling of Industrial Strain Gages.** C. Rohrbach. *Archiv*

für technisches Messen, 1954, no. 221, June, p. 135-138.

Preparation of materials, type of glue, drying and operation. Photographs. 7 ref. (Q25)

733-Q. (Russian.) **Stress Concentration in Sheet Elements of Metallic Structures.** N. D. Tarabasov. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1953, no. 12, Dec., p. 1700-1735.

Methods and equations for approximate solution of stress distribution problems between individual rivets. Diagrams. 5 ref. (Q25)

734-Q. (Russian.) **Effect of Boundary Zones Containing Low-Melting Components Upon Results of the Determination of Heat Resistance of Alloys by Various Deformation Methods.** A. A. Bochvar, M. E. Drits and E. S. Kadaner. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 2, Feb., p. 42-45.

Determination of hardness of several magnesium alloys during heating from 25 to 300° C. Micrographs, tables, charts. (Q29, Mg)

735-Q. (Russian.) **Influence of Impurities on Heat Resistance of Aluminum.** A. A. Bochvar, Z. A. Sviderskaia and L. M. Kychakova. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 2, Feb., p. 46-51 + 1 plate.

Influence of iron and silicon on high-temperature hardness. Tables, graphs, micrographs. (Q29, Al)

736-Q. (Russian.) **The Mechanism of Stress Relaxation in Metals.** B. M. Rovinskii. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 2, Feb., p. 67-74.

Data from tests on aluminum and copper show departure from true elasto-viscous flow. Graphs. 11 ref. (Q25, Al, Cu)

737-Q. (Russian.) **Distribution of Work Hardening in Rail Heads.** I. V. Vikker. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk,* 1954, no. 2, Feb., p. 75-78.

Experimental investigation of plastic deformation. Table, graphs. 6 ref. (Q24, Q29, CN)

738-Q. (Russian.) **Carrying Capacity and Strength Calculation of Parts Under Static and Variable Stresses.** S. V. Serensen and L. A. Kozlov. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 3-11.

Fatigue strength of machine parts and use of fatigue test data in machine design. Graphs, diagrams, tables. 8 ref. (Q7)

739-Q. (Russian.) **Strength of Steel Tubes for High Pressure Boilers.** N. S. Leleev, E. A. Troianskii and I. K. Korikovskii. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 11-13.

Formula for calculating wall thickness required. Table, graph, photographs, diagram. 2 ref. (Q23, S14, ST)

740-Q. (Russian.) **Determining Basic Parameters of Process of Bending With Tension.** E. N. Moshnin. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 36-41.

Analysis is made assuming that plastic bending takes place in linear conditions of state of stress. No account is taken of center elastic-deformation zone. Table, diagrams, graphs. (Q5, Q27)

741-Q. (Russian.) **Creep of Tubes.** S. N. Kats. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953, p. 58-63.

Creep investigations of cylindrical vessels under internal pressure. Tables, graphs, photograph, diagram. (Q3, CN, AY)

742-Q. (Russian.) **Determining Residual Forces in Forgings of Turbine Disks.** M. M. Kobrin. *Vestnik Mashinostroeniia,* v. 34, no. 1, Jan. 1954, p. 29-34.

Stresses investigated in chromium-molybdenum steels by successive boring and cutting of rings from the hub. Diagrams, tables, photographs. 4 ref. (Q25, AY)

743-Q. (Russian.) **Efficiency of Surface Hardening of Parts With Transverse Holes.** I. V. Kudriavtsev and N. M. Savvina. *Vestnik Mashinostroeniia,* v. 34, no. 1, Jan. 1954, p. 61-65.

Tests with steel plates and rods to establish effects of cold hardening on fatigue strength during blending and torsion. Tables, graphs, photographs. 4 ref. (Q7, J28, CN)

744-Q. (Russian.) **Effect of Cold Working by Shot Peening on Impact Fatigue Strength of Steel.** N. A. Karasev. *Vestnik Mashinostroeniia,* v. 34, no. 1, Jan. 1954, p. 66-68.

Experimental results. (Q7, G23, ST)

745-Q. (Swedish.) **Tentative Classification of Mild Steel With Regard to Tendencies Toward Brittle Fracture.** Gunnar Malmberg. *Jernkontorets Annaler,* v. 138, no. 6, 1954, p. 333-349.

Proposal for evaluation of steels according to impact test data. Diagrams, charts, tables. 5 ref. (Q26, Q6, ST)

746-Q. (Book.) **The First Midwestern Conference on Solid Mechanics, Proceedings.** 199 p. 1953. University of Illinois, Engineering Experiment Station, Urbana, Ill. $5.00.

Consists of 38 papers on strength of structures and materials. (Q23)

747-Q. (Book.) **Mechanical Properties of Machinability Program Work Materials.** 29 p. U. S. Dept. of Commerce, PB 111296, Office of Technical Services, Washington 25, D. C. $1.00.

Tensile tests plotted as curves of stress versus natural strain. Results of Brinell hardness tests.
(Q27, Q29, G17)

748-Q. (Book.) **Mechanical Testing of Metallic Materials.** R. A. Beaumont. 3rd Ed. 250 p. Sir Isaac Pitman & Sons Ltd. Pitman House, Parker Street, Kingsway, London. 25s.

Improved methods of proof stress. Application to aeronautical and general engineering. (Q general)

749-Q. (Book.) **Mechanics of Materials.** Philip Gustave Laurson and William Junkin Cox. 3rd Ed. 414 p. 1954. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $5.75.

Stresses and deformation in beams, shafts, springs, joints, and pressure vessels. (Q general)

750-Q. (Book.) **Properties of ML Aluminum Alloy.** 50 p. 1948. U. S. Air Force, U. S. Dept. of Commerce, PB 111329, Office of Technical Services, Washington 25, D. C. $1.00.

Casting and heat treating practices to improve mechanical and physical properties. Stress-rupture and creep properties.
(Q general, P general, Al)

751-Q. (Book.) **Twinning and Diffusionless Transformations in Metals.** E. O. Hall. 181 p. 1954. Butterworths Scientific Publications, Ltd., 4-6 Bell Yard, Temple Bar, London W.C. 2, England. 30s.

Structure and deformation of metal crystals; twinning; effects of stress and heat treatment.
(Q24, M26, M27)

752-Q. (Book—French.) **(Strength of Materials.) Résistance des Matériaux.** Robert L'Hermite. v. I. 860 p. 1954. Dunod, 92 rue Bonaparte, Paris 6, France. 8400 fr.

Theory of elasticity; internal equilibrium under tension, bending, and torsion; and analysis of isostatic structures, girders, and girder systems; thorough treatment of plates, slabs, and shells. (Q23, Q21)

753-Q. Elastic and Anelastic Behavior of Some Metals at Very Low Temperatures. Piero Giorgio Bordoni. *Acoustical Society of America, Journal,* v. 26, July 1954, p. 495-502.

Vibration frequency and damping have been measured as a function of temperature from 4.5-300 K, for lead, copper, aluminum, and silver rods. Tables, diagrams, photographs, graphs. 8 ref.
(Q21, Q22, Pb, Cu, Al, Ag)

754-Q. Flexure-Torsion Failure of Panels. John H. Argyris. *Aircraft Engineering,* v. 26, July 1954, p. 213-219.

Study of instability and failure of stiffened panels under compression when buckling in long wavelengths. Graphs, table, diagrams.
(Q1)

755-Q. An Appraisal of the Prot Method of Fatigue Testing. H. T. Corten, T. Dimoff and T. J. Dolan. *American Society for Testing Materials, Preprint no.* 69, 1954, 20 p.

Compares experimental results for three ferrous metals and an aluminum alloy with conventional fatigue data. Graph, tables. 17 ref.
(Q7, Al, AY)

756-Q. An Experimental Study of the Influence of Fluctuating Stress Amplitude on Fatigue Life of 75S-T6 Aluminum. H. T. Corten, G. M. Sinclair, and T. J. Dolan. *American Society for Testing Materials, Preprint no.* 70, 1954, 16 p.

Pattern of fluctuating stress consisted of repeated blocks of 10,000 cycles during which a minor or low stress amplitude was applied during the initial portion and a major or high stress amplitude was applied during the remainder of the cycles in each repeated block. Diagrams, tables, graphs. 15 ref.
(Q7, Al)

757-Q. Dynamic Creep and Rupture Properties of an Aluminum Alloy Under Axial Static and Fatigue Stress. F. W. DeMoney and B. J. Lazan. *American Society for Testing Materials, Preprint no.* 71, 1954, 14 p.

Fatigue, stress-rupture, and creep data obtained under various combinations of mean and alternating axial stress for rolled 24S-T4 at 300 and 500° F. Graphs. 8 ref.
(Q3, Q4, Q7, Al)

758-Q. Fatigue Strength of 14S-T4 Aluminum Alloy Subjected to Biaxial Stresses. R. W. Bundy and Joseph Marin. *American Society for Testing Materials, Preprint no.* 73, 1954, 12 p.

Influence of biaxial tension-tension and tension-compression stresses. Diagrams, photographs, graph. 13 ref. (Q7, Al)

759-Q. Softening of Certain Cold-Worked Metals Under the Action of Fatigue Loads. N. H. Polakowski and A. Palchoudhuri. *American Society for Testing Materials, Preprint no.* 74, 1954, 12 p.

The belief that fatigue of ductile metals is associated with progressive strain hardening is not true for initially cold worked metals. Tables, graphs. 22 ref.
(Q7, Al, Cu, Ni)

760-Q. A Simplified Statistical Procedure for Obtaining Design-Level Fatigue Curves. E. H. Schuette. *American Society for Testing Materials, Preprint no.* 75, 1954, 12 p.

Suggests a procedure that will provide design-level curves with only a fraction of testing time required for obtaining complete statistical data, and without mathematics. Diagrams, tables, graphs. 8 ref. (Q7)

761-Q. A Failure Criterion for Multi-Axial Fatigue Stresses. F. B. Stulen and H. N. Cummings. *American Society for Testing Materials, Preprint no.* 76, 1954, 14 p.

Relation is developed for predicting fatigue in polycrystalline metals subjected to any combination of steady and vibratory multi-axial stresses. Diagrams, tables. 16 ref.
(Q7)

762-Q. Poisson Effect in the Charpy Test. Carl E. Hartbower. *American Society for Testing Materials, Preprint no.* 77, 1954, 8 p.

Significance and measurement of the Poisson effect in the V-notch and keyhole Charpy tests. Graphs. 3 ref. (Q6, CN)

763-Q. Notch-Bar Tests of High-Strength Steel. R. Raring and J. Rinebolt. *American Society for Testing Materials, Preprint no.* 80, 1954, 7 p.

Charpy V-notch specimens of AISI 4340 steel heat treated to 210,000 psi. and 230,000 psi. were tested from 320 to −320° F. by the conventional impact test and by slow bending. Graphs, photographs.
(Q5, Q6, AY)

764-Q. Size Effect in the Tension Test of Mild Steel. Cedric W. Richards. *American Society for Testing Materials, Preprint no.* 84, 1954, 6 p.

Demonstrates a definite dependence of the upper yield point of mild steel on specimen size. Graph, table. 7 ref. (Q27, CN)

765-Q. A New Triaxial Stress Testing Machine for Determining Plastic Stress-Strain Relations. H. A. B. Wiseman and Joseph Marin. *American Society for Testing Materials, Preprint no.* 85, 1954, 17 p.

Stresses applied consist of two equal compressive principal stresses with the third principal stress either tension or compression. These triaxial stresses are produced by subjecting a cylindrical specimen to radial hydraulic pressure and axial tension or compression. Diagrams, graphs, photographs. 6 ref.
(Q25, Al)

766-Q. An Inexpensive Constant-Load Testing Machine. M. E. Clark and O. M. Sidebottom. *American Society for Testing Materials, Preprint no.* 85A, 1954, 4 p.

Design and features of machine for application and maintenance of constant loads. Diagram, graphs, table. (Q27)

767-Q. Piles Subjected to Lateral Thrust. I. Measurement of Earth Pressure and Deflection Along the Embedded Portion of a 40-Ft. Steel Pile. H. G. Mason and J. A. Bishop. **II. Analysis of Pressure Deflection, Moment, and Shear by the Method of Difference Equations.** L. A. Palmer and P. P. Brown. *American Society for Testing Materials, Preprint no.* 95-96, 1954, 30 p.

In-place properties of deep soil deposits in relation to pile foundations. Tables, graphs, diagram, photographs. 7 ref. (Q2)

768-Q. Constant and Cyclic-Load Creep Tests of Several Materials. Ward F. Simmons and Howard C. Cross. *American Society for Testing Materials, Preprint no.* 100d, 1954, 13 p.

Tests were madé on sheet specimens of 24S-T3 and 24S-T81 aluminum alloys at 300° F., SAE 4130 steel at 800° F., and AISI 310 stainless steel at 1500° F. Tables, graphs.
(Q3, Al, SS, AY)

769-Q. Creep Properties of Annealed Unalloyed Zirconium. M. J. Manjoine and W. L. Mudge, Jr. *American Society for Testing Materials, Preprint no.* 106a, 1954, 18 p.

Effect of state of anneal on creep. Tables, graphs, diagram, photographs. 11 ref. (Q3, Zr)

770-Q. The Creep Characteristics of Copper-Nickel Alloys at 300, 400, and 500 F. J. H. Port and A. I. Blank. *American Society for Testing Materials Preprint no.* 106b, 1954, 12 p.

Alloys tested were 90-10 copper-nickel containing 0.68% iron, 90-10 copper-nickel containing 1.08% iron, and 80-20 copper-nickel containing 0.19% iron. Micrographs, tables, graphs. 6 ref. (Q3, Cu, Ni)

771-Q. New Methods in the Analysis and Design of Structures in the Plastic Range. J. F. Baker and M. R. Horne. *British Welding Journal,* v. 1, July 1954, p. 307-315. (From *Revue Universelle des Mines,* v. 9, 1953, p. 326-336.)

Previously abstracted from original. See item 807-Q, 1953. (Q23)

772-Q. Design Stresses in Light-Alloy Rolling Stock. Wide Margin of Safety in Fatigue. R. Chadwick. *Engineering,* v. 178, July 9, 1954, p. 43-46.

Mechanical properties of aluminum alloys. Design factors including stresses and fatigue characteristics. Graphs, tables. 5 ref. (Q7, Q25, Al)

773-Q. Test New Alloy Steel for Pressure Vessels. *Iron Age,* v. 174, July 22, 1954, p. 120.

Burst and drop weight tests on tanks built of Carilloy T-1 steel and designed on basis of yield strength rather than ultimate strength. (Q23, AY)

774-Q. Strength Under Combined Tension and Bending in the Plastic Range. J. M. Frankland and R. E. Roach. *Journal of the Aeronautical Sciences,* v. 21, July 1954, p. 449-453, 474.

Analysis of bars of rectangular section. Graphs. 7 ref. (Q23, Al)

775-Q. The Strength of Short Cylinders Under Internal Pressure. D. G. Christopherson and G. R. Higginson. *Journal of the Mechanics and Physics of Solids,* v. 2, June 1954, p. 217-237 + 1 plate.

Method of estimating internal pressure required to cause plastic expansion of a uniform circular tube. Tables, graphs, diagram, photograph. 8 ref. (Q23, ST)

776-Q. An Experimental Investigation of Residual Stresses in Hollow Cylinders Due to the Creep Produced by Thermal Stresses. Y. G. Attia, D. Fitzgeorge and J. A. Pope. *Journal of the Mechanics and Physics of Solids,* v. 2, June 1954, p. 238-258 + 1 plate.

A series of thick hollow cylinders were subjected to a radial flow of heat by heating the bore and water-cooling the outer diameter for a chosen period of time, during which the thermal stresses were relaxed by creep. Diagrams, graphs, tables, photograph. (Q25, Q3, CI)

777-Q. Yield Criteria and the Bending of Wide Beams. D. A. Barlow. *Journal of the Mechanics and Physics of Solids,* v. 2, June 1954, p. 259-264 + 1 plate.

Ductility of aluminum alloys in bending. Graphs, photograph. 4 ref. (Q23, Q5, Al)

778-Q. On the Limits Set by Plastic Yielding to the Intensity of Singularities of Stress. R. Hill. *Journal of the Mechanics and Physics of Solids,* v. 2, June 1954, p. 278-285.

Deformation of a solid body under conditions of local stress. Diagrams. 10 ref. (Q25)

779-Q. Heat-Resisting Alloys. ASM Committee on Heat-Resisting Alloys. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 42-48.

Compositions and mechanical properties. Elevated-temperature tests, their limitations, and application to design and selection of heat resisting alloys. Graphs, tables. (Q23, SG-h)

780-Q. Engine Metals and Engine Wear. ASM Committee on Engine Metals. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 91-96.

Stresses and factors that influence wear of various engine parts. Selection of bearing and wear resisting metals. Graphs, diagrams, micrographs, tables. (Q9, T25, SG-e, m)

781-Q. Effect of Stress Concentration on Design Strength. ASM Committee on Stress Concentration. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 97-103.

Service failures from stress concentration. Definitions and basic concepts. Application to design. Notch sensitivity. Combined steady and alternating stress components. Notch effect for a limied number of cycles. Reducing effects of stress concentration. Photographs, diagrams, graphs. 39 ref. (Q25, Q7)

782-Q. Alloys for High Temperatures. (Digest of "Alloys for High-Temperature Service (Investigation of the Fundamental Factors Promoting High-Temperature Strength of Alloys)", by R. L. Beck, E. E. Fletcher, A. R. Elsea, A. B. Westerman and G. K. Manning; *ATI*-166644, Mar. 1952.) *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. A191-A193.

Studies of the fundamental factors responsible for high-temperature strength. (Q23)

783-Q. An Investigation of the Creep Lifetime of 75S-T6 Aluminum-Alloy Columns. Eldon E. Mathauser and William A. Brooks, Jr. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3204, July 1954, 28 p.

Results of static-strength and creep tests. Graphs, diagram, photographs, table. 9 ref. (Q3, Al)

784-Q. Plastic Design of Plate Girders With Unstiffened Webs. Jacques Heyman and V. L. Dutton. *Welding and Metal Fabrication,* v. 22, July 1954, p. 265-272.

Theoretical and experimental consideration of actual collapse conditions. Diagrams, tables, photographs, graphs. 4 ref. (Q23, CN)

785-Q. Effect of Thermal Activation on Fatigue Life of Butt Welds. A. M. Freudenthal and R. A. Heller. *Welding Journal,* v. 33, July 1954, p. 327S-338S.

Effect of rest periods at moderately elevated temperatures on mild steel specimens. Tables, graphs, diagram. 17 ref. (Q7, CN)

786-Q. Fatigue Tests on Welded Beam Connections. Otto Graf. *Welding Journal,* v. 33, July 1954, p. 365S-368S. (Abstracted from *Berichte des Deutschen Ausschusses für Stahlbau,* 1952, no. 17, p. 1-19.)

Tests on various types of weld joints. Diagrams. (Q7, K9, CN)

787-Q. (Dutch.) **Measuring and Regulating of Temperature in Creep Research of Metals.** R. Hengeveld. *Smit Mededelingen,* v. 9, no. 2, Apr.-June 1954, p. 33-37.

Importance of accurate temperature measurements. Photographs. (Q3, S16)

788-Q. (French.) **Influence of Nitrogen on the Properties of Steel.** F. Maratray. *Institut de Recherches de la Sidérurgie, Publications,* ser. B, no. 25, Mar. 1954, 47 p. (Reprinted from "La Documentation Metallurgique", Oct.-Nov.-Dec. 1953, no. 16, p. 127-173.)

Phase diagrams of iron-nitrogen system; influence of nitrogen on transformations, aging, and mechanical properties of plain carbon and alloy steel; production of steel with low nitrogen content; effect of nitrogen on welding; properties and characteristics of nitriding steel; and effect of production method on solubility of nitrogen in steel. Tables, graphs, micrographs, diagrams. 143 ref. (Q general, M24, N7, ST)

789-Q. (French.) **Transgranular Flaws and Plastic Deformation by Mechanical Working of Iron and Steel Surfaces.** Pierre A. Jacquet. *Revue de métallurgie,* v. 51, no. 6, June 1954, p. 385-400.

X-ray examination of deformation mechanism during abrasion of surfaces. Micrographs, table. 13 ref. (Q24, Fe, ST)

790-Q. (Italian.) **The Apparent Modulus of Elasticity of Porous Solids.** I. Barducci. *Alluminio,* v. 23, no. 3, May 1954, p. 261-268.

Effect of small cavities on mechanical properties. Tables, graphs. 2 ref. (Q21)

791-Q. (German.) **The Hardness of Martensite as a Function of Carbon Content.** Muzaffer Sagisman. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 271-272.

Macro and microhardness studies of unalloyed steels with 0.3 to 1.7% carbon. Graphs, micrographs. 11 ref. (Q29, CN)

792-Q. (German.) **Determination of Internal Stresses From X-Ray Lattice Constant Measurements.** Viktor Hauk. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 273-278.

Results of plastic and residual deformations show that composition, grain size, structure, and type and amount of cementite determine presence of internal stresses. Tables, micrograph, graphs. 45 ref. (Q25, CN)

793-Q. (German.) **Testing the Vibration Resistance of Cable Sheathing of Unalloyed and Slightly Alloyed Lead.** Wilhelm Hofmann and Reinhard Müller. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 6, June 1954, p. 247-252.

Preparation and testing of lead tubes. Results indicate improvements may be accomplished by small additions of copper, tin and antimony. Diagrams, graphs, table. (Q9, Pb)

794-Q. (Russian.) **Fine Structure of Aging Alloys in the Clearly Plastic Region.** N. F. Siutkin. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 503-505.

Changes of mechanical properties of zinc-aluminum alloys under various deformation rates and broad temperature range. Graphs. 4 ref. (Q24, Zn, Al)

795-Q. (Russian.) **Effect of Stress Deviator Form on Resistance of Metals to Plastic Deformation.** Iu. I. Iagn and I. N. Vinogradov. *Doklady Akademii Nauk SSSR,* v. 96, no. 3, May 21, 1954, p. 515-517.

Investigations on beryllium and aluminum bronze and technically pure iron. Graphs. 4 ref. (Q24, Al, Fe)

796-Q. (Russian.) **Fatigue Strength of Cast Iron Crankshafts.** I. V. Kudriavtsev and N. A. Balabanov. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 61-64.

Application and mechanical properties of high-strength cast iron and forged steel shafts. Diagrams, tables, graphs, photographs. 5 ref. (Q7, CI, ST)

797-Q. (Russian.) **Wear Resistance and Operational Reliability of Crankshafts From High-Strength Cast Iron.** B. N. Seredenko and G. V. Chepigin. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 65-68.

Various bushing and cam compositions tested. Tables, graphs, diagram, photograph. (Q9, CI)

798-Q. (Russian.) **Increasing the Static Strength and Longevity of Machine Parts by "Oriented" Work Hardening.** N. A. Karasev. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 68-73.

Effects of prestressing automobile parts subjected to severe loading. Graphs, table, photographs. 5 ref. (Q23)

799-Q. (Russian.) **Strength of Welded Joints.** V. Iu. Shishkin and N. I. Novozhilova. *Vestnik Mashinostroeniia,* v. 34, no. 6, June 1954, p. 73-75.

Longitudinal and transverse strengths of butt welds. Tables, photographs. (Q23, CN)

800-Q. (Spanish.) **Fatigue Strength of Welded Structures.** Z. Gracia Martin. *Ciencia y técnica de la Soldadura,* v. 4, no. 16, Jan.-Feb. 1954, 14 p.

Initiation and propagation of fatigue cracks; effects of notches and pre-existing defects; and relations between other mechanical properties and fatigue strength. Diagrams, tables, photographs. (Q7)

801-Q. The Impact Properties of Flake Graphite Cast Irons. G. N. J. Gilbert. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, June 1954, p. 298-317 + 1 plate.

Impact values for notched and unnotched specimens of eight cast irons correlated with the resilience obtained in a corresponding slow bend test. Tables, diagrams, photographs, graphs. 5 ref. (Q6, CN, CI)

802-Q. Stress vs. Strain in Hot Tearing. John B. Caine. *Foundry,* v. 82, Aug. 1954, p. 76 + 9 pages.

Disadvantages of stress concept and possibilities of strain concept. Diagrams, graphs, micrograph. 8 ref. (Q26)

803-Q. Correlation of the Properties of Castings and Test-Bars in Grey Cast Iron. Erik O. Lissell and Morris Itzel. *Foundry Trade Journal,* v. 97, July 15, 1954, p. 61-65.

Statistical comparisons of mechanical properties of castings of various shapes and bars of varying sizes. Tables, diagrams. 9 ref.
(Q general, E general, CI)

804-Q. How Stress Problems Are Anticipated and Solved in Automotive Bodies. Wilbur F. Karber. *General Motors Engineering Journal,* v. 1, July-Aug. 1954, p. 32-38.

Mathematical study of anticipated stress and strength areas of component parts. Photographs, tables, diagrams. 8 ref. (Q25)

805-Q. A Study of Some of the Properties of Materials Affecting Valve Reliability. E. A. O'Donnell Roberts. *Institution of Electrical Engineers, Proceedings,* v. 101, pt. 3 no. 72, July 1954, p. 197-205; disc., p. 205-209.

Mechanical failures of electron tubes including static and vibration-fatigue fractures. Diagrams, tables, graphs. 10 ref. (Q7)

806-Q. Cone Indentation Experiments. D. S. Dugdale. *Journal of the Mechanics and Physics of Solids,* v. 2, June 1954, p. 265-277.

Hardness tests in mild steel, copper and aluminum, using indenting tools having cone angles between 10 and 140°. Diagrams, graphs, tables. 6 ref. (Q29, CN, Cu, Al)

807-Q. Intercrystalline Failures During Creep. II. *Metal Industry,* v. 84, June 25, 1954, p. 554.

Factors which influence grain boundary movement and their effects. 4 ref. (Q3)

808-Q. The Influence of Creep on the Measured Hardness of Soft Metals. C. Rubenstein. *Physical Society, Proceedings,* v. 67, no. 415B, July 1954, p. 563-568.

Influence of creep during indentation process on the measured hardness of soft metals at room temperature. Graphs, table. 8 ref. (Q3, Q29, Pb, In, Zn, Sn)

809-Q. (English.) **Alloys for Turbo-Machines.** *Aciers Fins & Spéciaux Francais,* 1954, no. 17, June, p. 47-50.

Mechanical properties of refractory alloys. Photograph.
(Q general, T25, Ni, Cr, AY)

810-Q. (English.) **The Concept of Resilience.** *Aciers Fins & Spéciaux Francais,* 1954, no. 17, June, p. 76-81.

Importance, definition, value and limitations of impact testing. Photographs. (Q6)

811-Q. (French.) **Mechanical Characteristics of Two Cast Magnesium-Zirconium Alloys (Z5Z and RZ5).** Raoul Pradeau. *Fonderie,* 1954, June, no. 101, p. 3999-4006.

Elastic limits of various types of Z5Z and RZ5 alloys. Tables, graphs, diagrams, micrographs.
(Q21, Mg, Zr)

812-Q. (French.) **New Copper-Base Alloys Containing Tin.** E. C. Ellwood. *Métaux, Corrosion-Industries,*

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Mechanical properties of various alloys. Tables, graphs, photograph. (Q general, Cu, Sn, Be, Mn)

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Internal pressure and longitudinal stresses. Diagrams, graphs, tables. 22 ref. (Q25, CI)

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Effects of structure and metallic and nonmetallic inclusions on properties. Graphs, tables, diagrams. (To be continued.) (Q general, CI)

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Formulas for Hooke's law. Boltzmann theory of elastic aftereffect. Relaxation spectrum. Thermodynamic principles. Graphs. 32 ref. (Q21)

816-Q. Field Testing Technique Using the Bonded-Wire Strain Gage. Francis G. Tatnall. *ASTM Bulletin*, 1954, no 199, p. 62-66.

Use of gage on structural members. Diagrams. (Q25)

817-Q. Analysis of Stresses Induced by a Sandwich Proof Tester. W. S. Ericksen. *ASTM Bulletin*, 1954, no. 199, p. 80-83.

Discussion of stresses theoretically induced in a flat sandwich panel by a vacuum-operated device that applies a concentrated load and formulas for estimating stresses in core and facings. Photographs, diagrams. (Q25)

818-Q. Fatigue Strength of Screw Threads. J. E. Field. *Engineer*, v. 198, July 23, 1954, p. 123-124.

Effect of specimen size and hardness of nut material. Tables. (Q7)

819-Q. Friction and Wear Phenomena. O. E. Teichmann and W. P. Green. *National Conference on Industrial Hydraulics, Proceeding of the 9th Meeting*, v. 7, 1953, p. 1-26; disc., p. 27.

Effects of temperature, oxide films and metal properties. Hydrodynamic lubrication. Tables, diagrams, graphs, photographs. 13 ref. (Q9)

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Tests of a cylindrical semimonocoque shell of circular cross section mounted as a cantilever and loaded by direct shear at the tip. Photographs, diagrams, tables. 5 ref. (Q25)

821-Q. The Mechanical Properties of Consumable-Arc-Melted Kroll-Process Zirconium. R. G. Nelson, H. Kato and R. L. Carpenter. *U. S. Bureau of Mines, Report of Investigations* 5063, June 1954, 13 p.

Effects of temperature, cold work and annealing. Tensile properties are compared with earlier graphite-melted and crystal-bar zirconium. Graphs, tables. 14 ref. (Q23, Zr)

822-Q. (French.) **Variation of Effect of Adsorbed Gases on Mechanical Strength of Metal Wires as a Function of Their Diameter.** Auguste Clauss, *Comptes rendus*, v. 239, no. 1, July 5, 1954, p. 25-27.

Dependence of tensile strength on nature of gas. Graphs. 1 ref. (Q23, W, Ag, Cu, Pt)

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Comparison of available materials by a simplified test. Table, graphs, photographs, diagram. 13 ref. (Q25)

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Strain gage and photo-elastic studies. Results compared with American data. Photographs, graphs, diagrams, tables. 47 ref. (Q25)

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Apparatus and technique. Effects of degree of deformation, temperature and grain size on recovery rate. Diagram, graphs, table. 16 ref. (Q22, Cu)

826-Q. (Russian.) **Problem of Elastic-Plastic Bending of a Beam.** V. V. Moskvitin. *Moscow Universiteta, Vestnik, Seriia Fiziko-Matematicheskikh i Estestvennykh Nauk*, v. 9, no. 5, May 1954, p. 33-40.

Mathematical analysis of deformation and stresses. Graphs, table, diagrams. 2 ref. (Q5)

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Mathematical analysis. 5 ref. (Q24)

828-Q. (Russian.) **Graphic-Analytical Method of Analyzing Transverse Plastic Bending.** G. G. Balovnev. *Vestnik Mashinostroeniia,* v. 34, no. 7, July 1954, p. 12-15.

Determination of carrying capacity and residual deformation of beams. Graphs. 6 ref. (Q5)

829-Q. (Russian.) **Coefficient of Friction in a Heavily Loaded Contact.** N. F. Kuz'min. *Vestnik Mashinostroeniia,* v. 34, no. 5, May 1954, p. 18-26.

Special apparatus determines dependence of friction on sliding, rolling, lubricant, etc. Diagrams, graphs. 13 ref. (Q9)

830-Q. (Russian.) **Effect of Preliminary Treatment on Strength of Austenitic Steel.** I. A. Oding and A. P. Shishkova. *Vestnik Mashinostroeniia,* v. 34, no. 7, July 1954, p. 40-45.

Hot working, cold hardening, aging. Changes in hardness, plasticity and microstructure. Graphs, tables. 4 ref. (Q23, AY)

831-Q. (Russian.) **Results of Service Tests on Anti-Friction Cast-Iron Bushings in Machine-Tool Equipment.** Ia. G. Lifshits and S. F. Frolov. *Vestnik Mashinostroeniia,* v. 34, no. 7, July 1954, p. 48-50.

Condition of bushings in various lathe and press parts after service up to 8000 hr. Table. (Q9, CI)

832-Q. (Russian.) **Nature of Deformation of High-Strength Cast Irons.** K. V. Kovalev and A. A. Novik. *Vestnik Mashinostroeniia,* v. 34, no. 5, May 1954, p. 69-72.

Compares tension and torsion strengths of nodular iron with chromium-molybdenum and unalloyed irons. Tables, graphs. 3 ref. (Q27, Q1, CI)

833-Q. (Spanish.) **Fatigue Resistance of Welded Structures.** Garcia Z. Martin. *Ciencia y técnica de la Soldadura,* v. 4, no. 17, Mar.-Apr. 1954, 20 p.

Effect of notches, weld defects and material properties on fatigue resistance of welds. Graphs, micrographs, photographs, tables, diagrams. 7 ref. (Q7, K general, ST)

834-Q. (Photocopy.) **Low-Temperature Mechanical Properties, Including Fatigue, of Titanium-Base Alloys RC-130-B and Ti-150-A.** Report no. PB 112768. 41 p. 1952. Library of Congress, Publication Board Project, Washington 25, D.C. Microfilm $2.50; photostat $6.25.

Tensile strength, fatigue, hardness, impact and thermal expansion at temperatures ranging from 25 to −250° C. (Q general, P11, Ti)

835-Q. (Book.) **Elements of Structural Engineering.** Ernest C. Harris. 505 p. 1954. Ronald Press Co., 15 E. 26th St., New York, N. Y. $7.00

Noncivil engineering text including structural theory as applied to cranes and conveyor supports, welding, and new electrical and mechanical equipment affecting safety of existing buildings. (Q general)

836-Q. (Book.) **Residual Stresses in Metal and Metal Construction.** W. R. Osgood, editor. 363 p. 1954. Reinhold Publishing Corp., 330 W. 42nd St., New York 36, N. Y. $10.00.

Collection of 22 papers by residual stress experts. Comprehensive coverage of all types of residual stress existing in machines and structures whether arising from welding, machining, or other causes. (Q25)

837-Q. (Book.) **Review of Previous Work on Short-Time Tests for Predicting Fatigue Properties of Materials.** Report no. PB 111374. 65 p. 1953. U.S. Department of Commerce, Room 6227, Commerce Building, Washington 25, D.C. $2.50.

Methods of rapidly determining fatigue properties of materials without completing the usual S-N fatigue diagram. (Q7, Ti)

838-Q. (Book.) **Society for Experimental Stress Analysis, Proceedings** (Annual Volume), v. 11, no. 2, 1954, 222 p. Society For Experimental Stress Analysis, Central Square Station, P.O. Box 168, Cambridge 39, Mass.

Strain gage techniques; creep and fatigue testing; brittle coating and photo-elastic stress analysis. Individual papers separately abstracted. (Q25)

839-Q. (Book.) **Strength of Materials.** G. H. Ryder. 278 p. 1953. Cleaver-Hume Press Ltd., Wrights Lane, Kensington, London, W. 8, England. 21s.

Based on syllabus of the University of London with additional material on riveted joints, reinforced concrete, and continuous beams. Includes graphical methods useful in design, and essentials of materials testing. (Q23)

840-Q. **An Experiment to Illustrate Creep. Use of Costly Equipment Avoided.** N. S. J. Grassam and A. Prince. *Engineering,* v. 178, July 16, 1954, p. 74-75.

Rapid demonstration without use

of costly and complicated equipment. Diagrams, graphs. 5 ref. (Q3)

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Application of safety factor to the design. Possible unification of present diverse methods. Table, graph. (Q23, ST)

842-Q. Stress in Electrodeposits. R. A. F. Hammond. *Institute of Metal Finishing, Bulletin,* v. 4, Summer 1954, p. 145-162.

Stress measurement and influence of various factors on stress. Tables, diagrams, graphs. 21 ref. (Q25, L17)

843-Q. Nonsinusoidal Buckling Modes of Sandwich Plates. J. N. Goodier and C. S. Hsu. *Journal of the Aeronautical Sciences,* v. 21, Aug. 1954, p. 525-532.

Nonsinusoidal modes at lower critical loads explored by means of simplified core slab theory. Diagrams, graphs. 6 ref. (Q28)

844-Q. On the Concept of Stability of Inelastic Systems. D. C. Drucker and E. T. Onat. *Journal of the Aeronautical Sciences,* v. 21, Aug. 1954, p. 543-548, 565.

Simple models used to show differences between buckling in the plastic range and classical elastic instability. Comparison of static and kinetic criteria and their interrelations. Diagrams, graphs. 9 ref. (Q28, Q21)

845-Q. Effect of Aluminum on the Low Temperature Properties of Relatively High Purity Ferrite. H. T. Green and R. M. Brick. *Journal of Metals,* Aug. 1954; v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 906-913.

Aluminum reduced yield and flow stresses of iron but had little or no effect on ductility. Effects of temperature and composition on strain hardening. Tables, graphs. 13 ref. (Q23, Fe)

846-Q. Some Observations on Grain Boundary Shearing During Creep. Bernard Fazan, Oleg D. Sherby and John E. Dorn. *Journal of Metals,* Aug. 1954; v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 919-922.

Contribution of grain boundary shearing at same stress depends upon a temperature-compensated time, where the activation energy was similar to that for total high-temperature creep. Micrographs, tables. 12 ref. (Q3, Al)

847-Q. Maximum Shear Stress. A. R. Holowenko and H. G. Laughlin. *Machine Design,* v. 26, Aug. 1954, p. 159-161.

Clarification of some misconceptions in calculation of stress at a point for two-dimensional loading. Diagrams. (Q2)

848-Q. How Nuclear Radiation Affects Engineering Materials. D. O. Leeser. *Materials & Methods,* v. 40, Aug. 1954, p. 109-120.

Effect of radiation on mechanical and physical properties of metals. Photographs, tables, diagrams. 11 ref.

(Q general, P general, CN, SS, Ni)

849-Q. Microcracks in Metals. *Metal Industry,* v. 85, July 23, 1954, p. 66.

Theories and experiments in the anisotropy of metals. 2 ref. (Q26)

850-Q. The Creep Properties of 99.8% Purity Aluminium at 20-80° C. and at 250 and 450° C. J. McKeown, R. Eborall and R. D. S. Lushey. *Metallurgia,* v. 50, no. 297, July 1954, p. 13-15.

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Effect on notch-sensitivity, ductility at room and elevated temperature, tensile strength and corrosion resistance of stainless steels. Graphs, micrographs, table. (Q23, M27, R general, SS)

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Effects of phosphorus content and annealing and quenching treatment on ductility. Table, diagrams, micrographs. (Q23, J23, J26, CI)

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Rate of hardening of cadium, lead and zinc increased with increase in deformation. Diagram. 4 ref. (Q24, Cd, Pb, Zn)

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Increase of graphite flake size shown to cause decreases in tensile strength, apparent modulus of elasticity in tension and endurance limit. Tables, micrographs, graphs. 26 ref. (Q23, Q7, CI)

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Method calculates strength of welded joints by an empirically determined limit curve. Photographs, diagrams. 10 ref. (Q23)

885-Q. Effects of Temperature on Weld Metal Properties. J. Heuschkel. *Welding Journal,* v. 33, Aug. 1954, p. 388S-397S.

Tensile characteristics of arc-deposited carbon steel weld metal for two covered electrodes over a temperature range of −300 to +1400° F. Diagrams, tables, graphs, photographs. (Q23, K1, CN)

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Investigation to develop method for improving toughness and strength of weld joints in "unalloyed" titanium. Notched-bar impact testing. Graphs, tables, micrographs, diagram. 16 ref. (Q23, Q6, Ti)

887-Q. Influence of Columbium and Titanium Upon Plastic Properties of Stainless and Heat-Resisting Steels at High Temperatures. N. S. Alferova. *Henry Brutcher, Altadena, Calif., Translation no.* 2795, 11 p. (From *Stal,* v. 8, no. 10, 1948, p. 911-916.)

Mechanical properties and hot working characteristics. Graphs, diagram, photographs, micrographs. (Q23, F general, SS)

888-Q. Influence of Chemical Composition Upon the Hardness of Cast Iron. N. K. Ipatov. *Henry Brutcher, Altadena, Calif., Translation no.* 3063, 4 p. (From *Liteinoe Proizvodstvo,* v. 3, no. 8, 1952, p. 28.)

Distribution of hardness in 250 specimens from 107 heats. Table, graph. 2 ref. (Q29, CI)

889-Q. Strain Measurements in Gray Cast Iron by X-Ray and Mechanical Methods. V. Hauk. *Henry Brutcher, Altadena, Calif., Translation no.* 3289, 18 p. (Condensed from *Archiv für das Eisenhüttenwesen,* v. 23, nos. 9-10, 1952, p. 353-361.)

Previously abstracted from original. See item 1061-Q, 1952. (Q25)

890-Q. Some Observations Regarding the Creep Behavior of Zirconium-Alloyed Steels at 500° C. W. A. Fischer. *Henry Brutcher, Altadena, Calif., Translation no.* 3328, 10 p. (From *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, 1953, p. 397-400.)

Previously abstracted from original. See item 52-Q, 1954. (Q3, AY)

891-Q. Effects of Residual Stresses on the Behavior of Structures. F. Campus. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 1-21.

Measurement, origins, latent energy, comparison with working stress, effects on initiation and propagation of fracture. Photographs, diagrams, graphs. 10 ref. (Q25, ST)

892-Q. Residual Stresses in Welded Pressure-Vessel Manufacture. H. Harris. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 23-32.

Case histories show a combination of factors responsible for problems in welding and residual stress. Diagrams, radiograph.
(Q25, K general, ST)

893-Q. Some Typical Cases Where Residual Stresses Set Up by Welding Appear to Have Contributed to Ship Structural Failures. D. Arnott. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 33-39.

Case histories demonstrate locked-up stresses as important factor in causing structural failures in welded ships. Photographs.
(Q25, K general, ST)

894-Q. Residual Stresses as a Factor in Ship Fractures. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 41-44.

Residual stresses do not impair strength if material is in a notch ductile condition. 4 ref. (Q25, ST)

895-Q. Some Notes on Typical Residual Stresses Encountered in Welded Ships. P. Ffield. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 45-74.

Relation of stresses to strength, consideration of thermal stresses. Diagrams, photographs, graphs, table. 5 ref. (Q25, K general, ST)

896-Q. Some Considerations Regarding the Generation and Importance of Residual Welding Stresses. L. E. Benson. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 75-83.

Factors favoring development of high residual welding stresses and their relation to failures at all temperatures and under static and dynamic loading. Micrographs, diagrams. 4 ref. (Q25, K general, ST)

897-Q. Residual Stresses in Welding. W. Spraragen. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 85-102.

Local and reaction stresses in static loading, fatigue, impact, dimensional stability, distortion and corrosion. Methods to relieve stresses. Diagrams, graph. 23 ref. (Q25, Q23, Q6, Q7, R general, K general, ST)

898-Q. The Significance of Residual Stresses. C. W. MacGregor. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 103-126.

Classification of stresses, effects on flow and fracture strength. Graphs, diagrams, tables. 37 ref. (Q25, ST)

899-Q. Some Remarks on the Influence of Residual Stresses on the Brittle, Plastic, and Fatigue Behavior of Structures. P. P. Bijlaard. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 127-138.

Methods for avoiding high triaxial stresses. Diagrams. 11 ref. (Q25, Q23, Q7, ST)

900-Q. The Influence of Residual Stresses on the Behavior of Ductile Structures. M. R. Horne. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 139-161.

Effect on yield strength, plastic collapse, "shakedown" load, deflections and behavior of compression members. Diagrams, graphs, table. 22 ref. (Q25, Q23, CN)

901-Q. Shakedown of Elastic-Plastic Structures. P. G. Hodge, Jr. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 163-185; disc., p. 186-191.

Theorem for trusses, beams and frames, application of principles, paplicability of shakedown analysis. Diagrams, graphs, tables. 29 ref. (Q21, Q23)

902-Q. Microstresses Originated by Gas Inclusions. N. J. Petch. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 193-199.

Methods of gas production in metals and their effects. Tables. 14 ref. (Q25, N1)

903-Q. The Effect of Residual Stresses on High-Speed Impact Resistance. J. Miklowitz. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 201-217.

Need for experimental work in understanding effect of stresses in welded structures and their ability to withstand shock-type loadings. Tables, graph, photograph. 15 ref. (Q25, Q6, CN)

904-Q. Correlation of Residual Stresses With Fatigue Strength of Machine Elements and Related Phenomena. O. J. Horger and H. R. Neifert. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 219-253.

Fatigue tests on full-size members involving different states of residual stress and heat treatment. Diagrams, photographs, graphs, tables, micrographs. 37 ref. (Q25, Q7, J general, ST)

905-Q. Effect of Residual Stress on the Failure of Engineering Materials. D. Rosenthal. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 255-265; disc., p. 267-269.

Failure by yielding, static and dynamic fracture and fatigue failure. Diagrams, table, graph. 28 ref. (Q25, Q7, Q26)

906-Q. Measurement of Residual Stress. D. Rosenthal. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 271-283.

Theoretical assumptions and limitations of mechanical methods of measurement. Diagrams. 26 ref. (Q25)

907-Q. Residual Stresses Associated With Lattice Strains. G. B. Greenough. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 285-296.

Complicating factors determined by X-ray methods. Diagrams, graph, table. 13 ref. (Q25)

908-Q. Precautions to be Used in the Measurement and Interpretation of Residual Stresses by X-Ray Technique. W. S. Hyler and L. R. Jackson. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 297-303.

Differences in macro and microstress systems, assumption for isotropic behavior, limitations of X-ray measurements. Diagram, table. 7 ref. (Q25)

909-Q. Complete Determination of the State of Residual Stress in Solid and Hollow Metal Cylinders. H. Bühler. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 305-329.

Internal and external techniques. Graphs, diagrams. 30 ref. (Q25)

910-Q. Determination of Residual Stresses Below the Surface. W. Soete and R. VanCrombrugge. Paper from "Residual Stresses in Metals and Met-

al Construction". Reinhold Publishing Corp., p. 331-334.

Use of three strain gages permits reading while drilling. Relaxed strains a function of hole depth. Graphs, diagram. 3 ref. (Q25)

911-Q. (English.) **The Effect of a Surface Oxide Film on Torsional Relaxation.** B. I. Edelson and W. D. Robertson. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 583-590.

Tests on polycrystalline cadmium wires. Abnormal after-effect depends on presence and elastic properties of a surface film. Explanation by dislocation barrier theory. Diagram, graphs, tables. 9 ref. (Q1, Cd)

912-Q. (English.) **The Elastic Constants of Copper Alloys.** J. R. Neighbours and Charles S. Smith. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 591-596.

Data for single crystals of dilute solutions of aluminum, silicon, zinc, gallium and germanium in copper. Changes of shear constants in terms of electrostatic and ionic contributions. Tables. 14 ref.
(Q21, Cu, Al, Si, Zn, Ga, Ge)

913-Q. (English.) **Internal Friction in Oxygen-Vanadium and Nitrogen-Vanadium Solid Solutions.** R. W. Powers. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 604-607.

Activation energies for peaks occurring at 186 and 272° C. Graphs. 10 ref. (Q22, P13, V)

914-Q. (English.) **Effect of Orientation Difference on the Plastic Deformation of Aluminum Bicrystals.** K. T. Aust and N. K. Chen. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 632-638.

Techniques for growing and testing single and bicrystal specimens. Results discussed in terms of slip activation and obstruction of dislocations at grain boundaries. Photograph, micrographs, diagram, graphs, table. 15 ref. (Q24, Al)

915-Q. (English.) **Bending Creep of "Duplex" Zinc Single Crystals.** R. Eisner. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 642-643.

Tests with progressively higher constant moments on 31 crystals. Effects of stress reversal, etching and electropolishing. 3 ref. (Q3, Zn)

916-Q. (English.) **Studies on the Creep of Low-Carbon Steel.** Toshio Nishihara, Shuji Taira and Kichinosuke Tanaka. *Memoirs of the Faculty of Engineering, Kyoto University,* v. 16, no. 2, Apr. 1954, p. 79-99.

Test equipment and results, characteristics analyzed, and results under bending and twisting moment. Diagrams, graphs, tables. 3 ref.
(Q3, CN)

917-Q. (English.) **On Fundamental Equation of the Dynamical Behaviours of Nonlinear Visco-Elastic Bodies.** Yoshikazu Sawaragi and Hidekatsu Tokumaru. *Memoirs of the Faculty of Engineering, Kyoto University,* v. 16, no. 2, Apr. 1954, p. 100-111.

Theory and formulation of equations for strain and stress relaxation. Diagrams, graphs. 1 ref. (Q21)

918-Q. (French.) **Effect of Preliminary Cold Working on Brittleness Due to the Hydrogen in Steels.** Pierre Amiot, Pierre Azou, and Paul Bastien. *Comptes rendus,* v. 239, no. 2, July 12, 1954, p. 164-166.

Includes graphs. 5 ref. (Q23, AY)

920-Q. (French.) **Geometric Form of Watch Springs.** Paul George. *Comptes rendus,* v. 239, no. 3, July 19, 1954, p. 236-237.

Area of maximum fatigue and breaking point. Finding ideal geometrical form. (Q7, T8, ST)

921-Q. (French.) **Surface Granulation After Plastic Deformation: Relationship to Cold Working and Annealing Conditions.** J. Hérenguel and F. Santini. *Revue de métallurgie,* v. 51, no. 7, July 1954, p. 482-488; disc., p. 488.

Cold working causes progressive reduction and eventual disappearance of granulation if the amount of cold working is sufficiently great. Photographs, graphs, tables. 7 ref. (Q24, Al)

922-Q. (French and German.) **Internal Stresses and Warping of Watch-Part Blanks.** W. Brandt. *Pro-Metal,* v. 6, no. 39, June 1954, p. 354-359.

Cause, calculation and elimination of internal stresses. Effect of tempering temperature on mechanical properties of brass. Graphs, table, diagrams. (Q25, Q general, Cu)

923-Q. (German.) **Orientation Dependence of Plastic Deformation of Slightly Elongated Aluminum Monocrystals.** Georg Masing and Helmut Weik. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 417-428.

Preparation of single crystals, determination of critical shear stress, plastic stress-strain curves, flow curves and their peculiarities. Diagrams, graphs, table. 40 ref.
(Q24, Al)

924-Q. (Russian.) **Change in Structure and Properties of Metal Used in High-Pressure Electric Power Plants.** A. Z. Kontorovskii. *Energetik,* v. 2, no. 7, June 1954, p. 23-26.

Chemical analysis, microstructure, and stress analysis of boiler pipes, etc. Tables, micrographs.
(Q25, M27, AY)

925-Q. (Russian.) **Elastoplastic Distortion of a Beam With Initial Stress-**

es. V. V. Moskvitin. *Moskovskogo Universiteta, Vestnik, Seriia Fiziko-Matematicheskikh i Estestvennykh Nauk,* v. 4, no. 6, June 1954, p. 47-58.
Mathematical analysis of deformation and residual stresses. Diagrams, graphs, tables. 3 ref. (Q24, Q25)

926-Q. Behaviour in Pure Bending of Box Girders. J. C. Chapman. *Engineer,* v. 198, Aug. 20, 1954, p. 253-257.
Effect of buckling in webs without added complication of flange buckling. Diagrams, graphs. 3 ref. (Q5)

927-Q. Effect of Grinding on the Fatigue Strength of Steels. D. N. Cledwyn-Davies. *Engineer,* v. 198, Aug. 20, 1954, p. 270-272.
Fatigue tests carried out in rotating-beam machine giving uniform bending moment. Limiting fatigue ratios determined on several alloy and carbon steels. Tables, diagrams. (Q7, G18, AY, CN)

928-Q. Notch Ductility of Nodular Irons. G. A. Sandoz, H. F. Bishop and W. S. Pellini. *Foundry,* v. 82, Sept. 1954, p. 114-119, 263-266.
Drop weight test data on 88 heats. Photographs, graphs, table. 3 ref. (Q23, CI)

929-Q. How Radiation Affects Structural Materials. I-II. C. R. Sutton and D. O. Leeser. *Iron Age,* v. 174, Aug. 19, 1954, p. 128-131; Aug. 26, 1954, p. 97-100.
Mechanical and physical properties of nearly all materials are changed. Data for various combinations of radiation level and temperature. Tables, diagrams, graphs. (Q general, P general)

930-Q. Creep-Rupture Characteristics of Al-Mg Solid-Solution Alloys. Arthur W. Mullendore and Nicholas J. Grant. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 973-979.
Alloys containing 0.94, 1.92 and 5.10% magnesium tested at 500, 700 and 900° F. Tables, graphs, micrographs. 13 ref. (Q3, Q4, Al)

931-Q. Influence of Oxygen and Nitrogen in Solution in Alpha Titanium on the Friction Coefficient of Copper on Titanium. W. R. Yankee and E. S. Machlin. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 989-990.
Solid solutions have markedly lower friction against softer metals than does pure titanium. Graphs. 6 ref. (Q9, Ti)

932-Q. Preferred Orientation of Cold-Rolled Uranium Foil. W. Seymour. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 999-1003.
Cold reduction by 90% resulted in duplex texture. Results compared with orientations of several hexagonal close-packed metals. Diagrams, tables. 20 ref. (Q24, U)

933-Q. Effects of Temperature on the Deformation of Beta Brass. Charles S. Barrett. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1003-1008.
Impact hardness tests from −200 to 600° C. Formation of deformation bands and absence of twinning. Micrographs, graphs. 19 ref. (Q24, Cu)

934-Q. Stress-Strain Characteristics and Slip-Band Formation in Metal Crystals: Effect of Crystal Orientation. F. D. Rosi. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1009-1020.
Plastic properties of silver and copper crystals during early stages of flow. Work hardening in terms of dislocation theory. Tables, graphs, diagrams, micrographs. 34 ref. (Q24, M26, Ag, Cu)

935-Q. Effect of Tempering on the Hardness of Retained Austenite. Philip Stark and B. S. Lement. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1074-1075.
Tests on high-purity iron alloy with 1.7% carbon indicate that apparent increase of hardness is due to formation of surface martensite during polishing. Graphs, micrograph. 4 ref. (Q29, J29, CN)

936-Q. Decrease of Density During Plastic Deformation of Nodular Cast Iron. W. R. Clough and M. E. Shank. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1093-1094.
Mechanical and physical properties of three heats of different compositions. Graph, tables, micrographs. 3 ref. (Q24, P10, CI)

937-Q. Magnesium Alloys for Elevated Temperature Applications. *Magnesium,* 1954, Aug. p. 13-16.

Mechanical properties of magnesium-zinc-rare earth alloys. Photograph, table, graphs.
(Q general, Mg)

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Improved polishing technique reveals brittleness is not due to any distinct phase present at grain boundaries. Micrographs. 12 ref. (Q23, M27, Cu)

939-Q. Comparative Investigation at Fluctuating Tension (R = O) on Dural Lugs of Different Design. A. Hartman. *Netherlands National Luchtvaartlaboratorium Report M.* 1932, Oct. 1953, 21 p.

Results of fatigue tests. Tables, graphs, diagrams, photographs. (Q7, Al)

940-Q. Design for Fatigue. E. H. Spaulding. *SAE Transactions,* v. 62, 1954, p. 104-115; disc., p. 115-116.

Fatigue design of aircraft lower wing surfaces. Diagrams, graphs, photograph. 9 ref. (Q7)

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Effect of cooling rate and movement of trapped stresses. Methods giving quantitative results serve as good indices of stresses present in complex castings. Photographs, graphs, diagram. (Q25, CI)

942-Q. Service and Testing Observations of Fatigue Failure in Helicopter Components. Richard M. Carlson and F. David Schnebly. *SAE Transactions,* v. 62, 1954, p. 376-384.

Corrective measures taken in design, manufacturing and field errors. Photographs, graphs, micrographs. (Q7)

943-Q. Effect of Temperature on Endurance Limit and Relaxation of Spring Materials. F. P. Zimmerli and W. P. Wood. *SAE Transactions,* v. 62, 1954, p. 557-565.

Maximum stresses sustained and losses in load-carrying capacity above and below atmospheric temperatures. Photographs, graphs, tables. 4 ref. (Q7, Q3)

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Strength and corrosion resistance of various enameled aluminum products. Photographs.
(Q23, R general, L27, Al)

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Stress-strain curves for compression, tension and shear loadings. Table, photographs, diagrams graphs. 4 ref. (Q27 Q28 Q1, H general)

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Differential equations and boundary conditions. Table, diagrams, graph. 2 ref. (Q1)

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948-Q. An Analysis of the Stability and Ultimate Bending Strength of Multiweb Beams With Formed-Channel Webs. Joseph W. Semonian and Roger A. Anderson. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3232, Aug. 1954, 28 p.

Design curves and procedures for calculating stresses for instability and failure. Photographs, diagrams, graphs. 9 ref. (Q5)

949-Q. (German and French.) **Does Stamp-Marking Weld Seams Impair Their Original Strength?** E. Brandenberger and C. Theiler. *Zeitschrift für Schweisstechnik,* v. 44, no. 8, Aug. 1954, p. 169-172.

Experiments show weld seams may be safely marked if left in the as-welded state, but not if worked on or machined. Photographs.
(Q23, K9)

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Effects of solid and gaseous inclusions on workability. Photographs. 4 ref. (Q23, Ag, Cu)

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Tests on five alloys at various temperatures and loads. Graphs, tables, micrographs, photograph. 14 ref. (Q3, Ag)

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Wear resistance of metals and requirements of contact materials. Applications of various metals and alloys. Graphs, tables. 8 ref. (Q9, T1, EG-c, Cu, W, Mo)

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Constant magnitude of slip lines explained by formation of briefly viscous films and by shifting of zones adjoining these films due to relaxation. Heating effect along slip planes and effect of plastic deformation on the properties of the material. Photograph, diagram. 12 ref. (Q24)

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Fractures caused by age, reduced cross section, inexpert welding or heat treatment. Screens to protect hooks and suspensions from radiant heat proved highly successful. Photographs, tables, diagrams, graphs. 10 ref. (Q26, ST)

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Mathematical computation of shear stress of displacement ring in slip plane. Diagrams. 5 ref. (Q24, Q2)

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Scattering and decrease of interference lines of untempered martensite. Fine crystalline structure of martensite of tempered steel. High resistance to plastic deformation. Table. 29 ref. (Q29, Q24, M26, ST)

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Mathematical treatment of residual stresses and analysis of cutting forces. Diagrams, graphs. 3 ref. (Q25, G17, ST)

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Differential correlations between invariants of stress and strain. Formulas linking tensors. Graphs. 12 ref. (Q25)

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Mathematical treatment. 2 ref. (Q25)

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Orientation depends on sliding surfaces in crystal lattice, direction of metal flow and forces applied. Drawing and cold rolling compared. Diagrams. 3 ref. (Q24, ST)

961-Q. (Book.) **Aluminum Structural Design.** 129 p. 1951. Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.
Mechanical properties and fabricating considerations. Design data on special shapes. (Q general, T26, Al)

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Uses and limitations; applications in prevention of failure in engineering structures and machines. (Q25)

963-Q. (Book.) **Solution of Problems in Strength of Materials.** S. A. Urry. 381 p. Sir Isaac Pitman & Sons, Ltd., Parker St., Kingsway, London, W.C.2, England. 20s.
Formulas and sample calculations of stress, strain, elasticity, shearing force, bending moment, torsion, deflection, beams and struts, thin and thick cylindrical shells, strain energy, and springs. (Q23)

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Consideration of plates subjected to shear along the two perpendicular edges together with uniform compression in all directions. Tables, graphs. 3 ref. (Q28, Q2)

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Stress analysis method in which swept wings are treated as orthotropic sandwich plates. Diagrams. (Q25)

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Curves show compressive (flexural instability) strength of tubes made from steel and aluminum alloys. Graphs. (Q28, ST, Al)

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Effect of hydrostatic pressure on shear properties of mild steel, annealed copper, cold-worked copper, silicon-aluminum, high purity zinc and zinc-aluminum alloy. Graphs, diagram. 4 ref.
(Q2, CN, Cu, Si, Al, Zn)

969-Q. Machine Design for Cyclic Stress. J. S. Caswell. *Engineer,* v. 198, Sept. 3, 1954, p. 318-321.

Characteristics and effects of cyclic stressing, effects of stress concentration. New formula for use in cyclic stress design. Diagrams, graphs. 20 ref. (To be continued.) (Q25)

970-Q. Importance of the Correct Shape of the Diamond Hardness Indenter. K. Meyer. *Industrial Diamond Review,* v. 14, Aug. 1954, p. 167-169.

Errors caused by the indenter due to geometrical form, surface quality and seat of the diamond in its metallic socket. Micrographs. (Q29)

971-Q. A Study of Preferred Orientation in Extruded, Drawn, and Annealed Copper. Paul G. Bastien and J. Pokorny. *Institute of Metals, Journal,* v. 82, Aug. 1954, p. 545-549.

Influence of degree of working, added elements and annealing temperature after deformation. Connection between deformation and recrystallization textures. Diagrams, tables. 15 ref. (Q24, N5, Cu)

972-Q. The Cleavage Fracture of Pure Polycrystalline Zinc in Tension. G. W. Greenwood and A. G. Quarrell. *Institute of Metals, Journal,* v. 82, Aug. 1954, p. 551-560.

Effects of grain size, temperature, strain rate and plastic deformation on type of fracture and true fracture stress. Graphs, tables. 19 ref. (Q27, Q26, Zn)

973-Q. Preferred Orientation in Rolled Uranium Sheet. J. Adam and J. Stephenson. *Institute of Metals, Journal,* v. 82, Aug. 1954, p. 561-567.

Deformation texture as a mixture of grains is accurate for high temperature and high total rolling reduction. Diagrams, tables, graphs. 11 ref. (Q24, U)

974-Q. Some Effects of Hydrogen on the Delayed Fracture of High-Tensile Steel. Winifred A. Bell and A. H. Sully. *Iron and Steel Institute, Journal,* v. 178, Sept. 1954, p. 15-18.

Study of fracture under prolonged loading of 0.9% carbon steel which had been pickled. Griffith crack theory applied to results. Photograph, table. 11 ref. (Q26, CN)

975-Q. The Elasticity of an Isotropic Aggregate of Anisotropic Cubic Crystals. A. V. Hershey. *Journal of Applied Mechanics,* v. 21, Sept. 1954, p. 236-240.

Analysis of stress distributions in a polycrystalline cubic metal with isometric and randomly oriented crystalline grains. Tables, diagrams, graph. 51 ref. (Q21, M26)

976-Q. The Plasticity of an Isotropic Aggregate of Anisotropic Face-Centered Cubic Crystals. A. V. Hershey. *Journal of Applied Mechanics,* v. 21, Sept. 1954, p. 241-249.

Analysis of plastic deformation in terms of plasticity of individual grains. Tables, diagrams. 75 ref. (Q24, M26)

977-Q. Internal Friction and Dynamic Modulus of Cold-Worked Metals. A. S. Nowick. *Journal of Applied Physics,* v. 25, Sept. 1954, p. 1129-1134.

Nonlinear, Köster and viscosity effects. Table, graphs. 25 ref. (Q22)

978-Q. The Application of Membrane Analogy for the Determination of Torsional Ridigity of Non-Circular Solid Shafts. V. Cadambe and R. K. Kaul. *Journal of Scientific & Industrial Research,* v. 13, sec. B, July 1954, p. 455-461.

Applies soap film analogy. Torsion constant determined by "least squares" method. Diagrams, graphs, tables. 8 ref. (Q1)

979-Q. Brittle Failure of Steel Structures—a Brief History. M. E. Shank. *Metal Progress,* v. 66, Sept. 1954, p. 83-88.

Although 250 welded ships have been disabled since 1940 by brittle cracking, such failures began as soon as steel plate became available for structural use and include storage tanks, bridges, booms and long pipe lines. (Q23, Q26, ST)

980-Q. Relations Between the Elastic Moduli and the Plastic Properties of Polycrystalline Pure Metals. S. F. Pugh. *Philosophical Magazine,* v. 45, 7th ser., no. 367, Aug. 1954, p. 823-843.

Includes tables, graphs. 29 ref. (Q21, Q23)

981-Q. Computation of Initial Buckling Stress for Sheet-Stiffener Combinations. H. L. Cox. *Royal Aeronautical Society, Journal,* v. 58, Sept. 1954, p. 634-638.

Short survey of theory on which Structures Data Sheets are based and manner of application. 3 ref. (Q28)

982-Q. The Physical Meaning of Indentation Hardness. D. Tabor. *Sheet Metal Industries,* v. 31, no. 329, Sept. 1954, p. 749-757; disc., p. 757-763.

Physical concept of indentation process explains empirical relations in good agreement with observations. Graphs, tables, diagrams, photographs. 5 ref. (Q29)

983-Q. The Practical Testing of the Cohesive Strength and Weldability of Steels. W. A. Felix. *Sulzer Technical Review,* 1954, no. 1, p. 33-43.

Tensile, bending and notch-impact tests. Measuring hardening and embrittlement in the heat affected zone of a single-pass weld bead. Diagrams, photographs, graphs, micrographs. (Q23, K9, ST)

984-Q. Bending Tests on Box Beams Having Solid and Open-Construction Webs. Aldie E. Johnson. Jr. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3231, Aug. 1954, 25 p.

Studies effects of replacing alternate webs by open, post-stringer construction. Photographs, tables, graphs, diagrams. 8 ref. (Q5)

985-Q. The Fracture of Metals. N. J. Petch. Paper from "Progress in Metal Physics", v. V, Interscience Publishers, Inc., p. 1-52 + 3 plates.

Principles, types, stress systems. thermodynamic theories. Graphs, tables, diagrams, photographs. 183 ref. (Q26)

986-Q. Geometrical Aspects of the Plastic Deformation of Metal Single Crystals. R. Maddin and N. K. Chen. Paper from "Progress in Metal Physics", v. V, Interscience Publishers, Inc., p. 53-95 + 10 plates.

Slip bands, kink bands and glide planes. Diagrams, micrographs, tables. 128 ref. (Q24)

987-Q. (German and French.) **New Fatigue-Testing Installation of the Research Institute of the Aluminum Industry Co. in Neuhausen.** E. von Burg. *Aluminium Suisse,* v. 4, no. 4. July 1954, p. 140-141.

Equipment for testing whole construction parts. Photographs. (Q7, Al)

988-Q. (German.) **Correlation Between Microhardness and Macrohardness.** Werner Schultze and Ludwig Schimmer. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 7-8, July-Aug. 1954, p. 337-339.

Kick's law of similarity and Meyer's exponential function, establishment of Meyer's straight-line curve from Vickers microhardness measurements at loads of 10-3000 grams and computation of macrohardness by extrapolation to higher loads. Graphs, tables, micrograph. 6 ref (Q29)

989-Q. (German.) **Correlation Between Micro and Macro-Hardness of Ferrite and Aluminum Crystals.** Alexander Schepers and Werner Bartholome. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 7-8, July-Aug. 1954, p. 341-343.

Comparison of extrapolated with measured values shows that extrapolation of microhardness, into the range of macrohardness, yields useful values. Tables, graphs. 3 ref. (Q29, Fe, Al)

990-Q. (German.) **Conditions for the Initiation and Extension of Brittle and Deformation Fracture on the Basis of the Characteristics of Dislocations. I. Stability Limits Between Displacement Orientation and Holes. II. Formation and Expansion of Cracks to the Point of Fracture and Effect of Temperature, Rate of Stressing, and State of Stress.** Albert Kochendörfer *Archiv für das Eisenhüttenwesen,* v 25. nos. 7-8, July-Aug. 1954, p. 351-372.

Review of literature and theoretical discussion. Diagrams, tables. graphs. 119 ref. (Q24)

991-Q. (Polish.) **Tests of Zinc and Aluminum-Base Bearing Alloys.** S. Balicki. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 3, 1954, p. 142-148.

Tests show zinc-aluminum-copper alloys to be good substitutes for usual bearing alloys containing large amounts of tin. Tables, graphs, micrographs. 7 ref. (Q9, T7, Zn, Al, Sn)

992-Q. (Russian.) **Resistance to Wear of Metallic Alloys During Grinding of Glass.** Ia. N. Malinochka. *Steklo i Keramika,* v. 11, no. 8, Aug. 1954. p. 14-23.

Wear resistance of aluminum alloy, cast iron and steel polishing wheels during abrasive grinding and polishing of glass. Tables, micrographs. (Q9, CN, Al, CI)

993-Q. The Tensile Characteristics of Unalloyed Zirconium at Low and

Moderate Temperatures. J. H. Keeler. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 5, 1954, 33 p.

Effects of strain rate, test temperature, grain size, preferred orientation and amounts of oxygen and nitrogen on strength properties. Tables, diagram, graphs, micrographs. 9 ref. (Q27, Zr)

994-Q. The Effect of Prestraining Under Different Stress States on the Fracture and Flow Properties of 2S-O Aluminum. I. Rozalsky. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 7, 1954, 28 p.

Strain states were held identical for all specimens. Effects of compression and biaxial tension in prestrain stress state. Diagrams, graphs, photographs. 12 ref. (Q27, Al)

995-Q. Deformation Mechanisms in Polycrystalline Aggregates of Magnesium. F. E. Hauser, C. D. Starr, L. S. Tietz and J. E. Dorn. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 8, 1954, 34 p.

Studies at atmospheric temperatures by metallographic and X-ray techniques. Micrographs, pole figures, tables, graphs, diagrams. 20 ref. (Q24, Mg)

996-Q. Tensile and Impact Properties of Low Carbon Martensites. C. C. Busby, H. W. Paxton and M. F. Hawkes. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 9, 1954, 22 p.

Mechanical properties of 38 specimens in the as-quenched and quenched and tempered conditions. Tables, graphs, micrographs. 4 ref. (Q27, Q6, ST)

997-Q. The Zonal Rolling Texture of Low Carbon Steel Cold-Rolled at Various Temperatures. C. Nusbaum and William Brenner, Jr. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 12, 1954, 16 p.

Data from production samples showing effects of mill temperatures. Tables, diffraction patterns, graphs. 9 ref. (Q24, CN)

998-Q. Influence of Substructure on the Shape of the Creep Curve. Thomas H. Hazlett and Rosa D. Hansen. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 20, 1954, 10 p.

Tests on nickel and nickel alloys show that substructure has a marked effect on creep behavior. Graphs, table. 9 ref. (Q3, Ni)

999-Q. The Elastic Limit and Yield Behavior of Hardened Steels. Hugh Muir, B. L. Averbach and Morris Cohen. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 23, 1954, 24 p.

Dependence of mechanical properties of carbon steels on tempering temperature. Diagram, tables, graphs. 16 ref. (Q21, Q23, CN)

1000-Q. Effect of Composition on Transverse Properties of Slack-Quenched Steel. John Vajda and Paul E. Busby. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 24, 1954, 15 p.

Effects of boron, rare earth oxides, silicon, nickel and carbon on hardenability and mechanical properties. Table, graphs. 2 ref. (Q general, J26, AY)

1001-Q. The Statistical Fatigue Properties of Lamellar and Spheroidal Eutectoid Steel. G. E. Dieter, R. F. Mehl and G. T. Horne. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 25, 1954, 19 p.

Effects of carbide morphology on specimens with various heat treatments. Evidence indicates fatigue cracks are not initiated by carbide particles. Tables, graphs, micrographs. 19 ref. (Q7, CN)

1002-Q. Effect of Static Stress on the Damping of Some Engineering Alloys. A. W. Cochardt. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 26, 1954, 12 p.

Damping increases with static stress for nonmagnetic materials and decreases for magnetic alloys. Tests were made from 70 to 1300° F., 910 to 51,000 psi. static stress, and 0 to 40,000 psi. vibrational torsion. Diagrams, table, graphs. 11 ref. (Q8, SS, Fe, Ni, Co, Cr)

1003-Q. The Effect of Deformation on the Martensitic Transformation in Austenitic Stainless Steels. H. C. Fiedler, B. L. Averbach and Morris Cohen. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 30, 1954, 19 p.

M^S temperature of 18-8 decreased markedly with increasing carbon. Small plastic strains stimulate transformations during cooling while large strains stabilize or suppress it. Tables, graphs, micrographs. 23 ref. (Q24, N8, SS)

1004-Q. Elevated Temperature Properties of Ductile Cast Irons. Charles R. Wilks, Norman A. Matthews and R. Wayne Kraft, Jr. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 34, 1954, 21 p.

Tests on three types of ductile iron from 800 to 1200° F. Tables, micrographs, diagram, graphs. 7 ref. (Q general, CI)

1005-Q. Effect of Cold Work on the High Temperature Creep Properties of Dilute Aluminum Alloys. Robert E. Frenkel, Oleg D. Sherby and John E. Dorn. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 35, 1954, 16 p.

New recovery model derived from experimental data. Principal effect of cold work is to reduce the stress parameter in the equation for creep rate. Tables, graphs, X-ray patterns. 15 ref. (Q3, Al)

1006-Q. Creep-Tempering Relationships in Hardened 4.5 Per Cent Chromium Steels. E. C. Roberts, N. J. Grant and Morris Cohen. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 36, 1954, 16 p.

Interrelations of tempering reactions and creep characteristics from 800 to 1300° F. Tables, graphs, micrographs. 12 ref. (Q3, J29, AY)

1007-Q. The Strength of Wrought Zirconium-Base Binary Alloys at 1800 to 2200° F. H. A. Saller, J. T. Stacy and S. W. Porembka. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 37, 1954, 14 p.

Effects of chromium, columbium, molybdenum, tantalum, tungsten and vanadium additives on workability, hardness and high-temperature strength. Diagram, tables, graphs. 8 ref. (Q23, Q24, Q29, Zr, Cr, Cb, Mo, Ta, V, W)

1008-Q. Effects of Cold Work on Cementite in Steel. D. V. Wilson. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 38, 1954, 27 p.

Magnetic and X-ray diffraction studies explain change of Curie point by cold work. Diagram, table, graphs. 17 ref. (Q24, P16, CN)

1009-Q. New Techniques for Measuring Forces and Wear. Warren P. Mason. *Bell Laboratories Record,* v. 32, Oct. 1954, p. 375-378.

Use of a barium titanate piezoelectric ceramic for measuring dynamic forces in telephone switching apparatus. Fundamentals of wear testing. Diagrams, oscillograms, circuits, graph, photograph. 1 ref. (Q9)

1010-Q. Machine Design for Cyclic Stress. II. J. S. Caswell. *Engineer,* v. 198, Sept. 10, 1954, p. 346-349.

Characteristics and effects of cyclic stressing with reference to use of base diagrams for design purposes. Diagrams, stress patterns, graphs. 20 ref. (To be continued.) (Q25)

1011-Q. Machine Design for Cyclic Stress. III. J. S. Caswell. *Engineer,* v. 198, Sept. 17, 1954, p. 378-381.

Characteristics and effects of cyclic stressing. Use of base diagrams for design purposes. Serious effects of stress concentration, and new formulas for use in cyclic stress design. Table, diagrams. 20 ref. (Q25)

1012-Q. The Yield Point in Steel. A Call to Improve the Quality of Sheets. G. Murray. *Engineering,* v. 178, Sept. 17, 1954, p. 366-369.

Effect of yield point in pressing. Methods for removing the yield point of sheets. Effect of internal stresses and lattice dislocations on yield point. Photographs, graphs, diagram, micrographs. (Q23, CN)

1013-Q. Proposed Tentative Method of Rapid Indentation Hardness Testing of Metallic Materials. *Foundry,* v. 82, Oct. 1954, p. 228.

ASTM designation E-54T as a data sheet. (Q29, S22)

1014-Q. A Study of the Impact of Spheres on Plates. J. P. A. Tillett. *Physical Society, Proceedings,* v. 67, no. 417B, Sept. 1954, p. 677-688.

Measurements of the coefficient of restitution for the impact of steel balls on plates of glass and plastics. Diagram, table, graphs. 16 ref. (Q6)

1015-Q. Applicability of Charpy Test Data. P. P. Puzak, M. E. Schuster and W. S. Pellini. *Welding Journal,* v. 33, Sept. 1954, p. 433S-441S.

Relation of performance in crack starter tests to Charpy V test data. Fracture propagation is difficult in welded structures of rimmed and semikilled steels at temperatures which show 20 ft-lb. Charpy V energy but higher values are indicated for fully killed steels. Table, graphs, photographs, diagrams. 5 ref. (Q6, CN)

1016-Q. Effect of Oxygen on Welding and Brazing Molybdenum. Timothy Perry, H. S. Spacil and John Wulff. *Welding Journal,* v. 33, Sept. 1954, p. 442S-448S.

Influence of oxygen on the mechanical properties of heat treated molybdenum related to welding and brazing. Tables, photograph, micrographs, graph. 26 ref. (Q general, K general, Mo)

1017-Q. (English.) **Measurement of Dynamic Stress on the Electric Overhead Travelling Crane Girder.** Noboru Onishi and Yasushi Kawakatsu. *Hitachi Review,* 1954, no. 6, July, p. 79-88.

Stress measurement of lifting action of load on 10-ton crane girder by photo cell-type strain gage. Diagrams, tables, photograph. 5 ref. (Q25)

1018-Q. (German.) **Electro-Acoustic Testing of Materials.** H. H. Rust. *Metall,* v. 8, nos. 17-18, Sept. 1954, p. 681-683.

Measurements of elasticity moduli and small changes in length of test rods, based on the excitation of longitudinal vibrations of test rods in their inherent frequency. Graphs, diagrams. 8 ref. (Q21)

1019-Q. (German.) **The Continuous Determination of Internal Stresses in a Solid Metal Cylinder.** H. Buhler and W. Schreiber. *Metall,* v. 8, nos. 17-18, Sept. 1954, p. 687-691.

Experimental method using chips obtained by surface machining and by drilling. Mathematical evaluation of results. Graphs, tables. 13 ref. (Q25)

1020-Q. **A Fatigue Testing Machine for Range of Stress.** James P. Romualdi, Chiao-Lin Chang and Charles F. Peck, Jr. *ASTM Bulletin,* 1954, no. 200, Sept., p. 39-43.

Effect of range of stress on fatigue properties of rotating-beam specimens. Full range of loading from pure tension to pure bending in any combination can be obtained. Photograph, diagrams, graphs, oscillograph, nomograph, tables. (Q7)

1021-Q. **Treatment of Tension Test Specimens for Fixing in Testing Machine.** H. Krenchel. *ASTM Bulletin,* 1954, no. 200, Sept., p. 44-46.

Plastic coatings prevent slip of specimens held by jaws of testing machines in static and fatigue tests. Photographs, diagram. (Q27, Q7)

1022-Q. **Thermoelectric Power and the Bauschinger Effect.** R. L. Woolley. *Nature,* v. 174, Sept. 18, 1954, p. 566-567.

Thermo-electric power and electric resistance tests on copper indicate that during Bauschinger strain the total disorder in the lattice does not increase but is merely re-arranged. 3 ref. (Q24, P15, Cu)

1023-Q. (French.) **Observations on the Elastic Range of Steels.** Robert de Strycker. *Revue de métallurgie,* v. 51, no. 8, Aug. 1954, p. 551-557; disc., p. 557.

Deformation produced in basic bessemer mild steels under stresses very close to the lower elastic limit. Diagrams, graphs, table. 4 ref. (Q21, CN)

1024-Q. (French.) **Examining Mechanical Properties of Steels by Magnetic Methods.** P. E. Lagasse. *Revue universelle des mines,* v. 10, ser. 9, no. 9, Sept. 1954, p. 608-616.

Magnetic state of a steel specimen being a function of its crystalline state and texture, it is possible to interpret, to a certain degree, changes in magnetic state observed during mechanical or heat treatments. Graphs, diagrams, photograph. 14 ref. (Q general, P16, ST)

1025-Q. (German.) **Creep and Relaxation Processes in Steel Wires in Concrete Beams.** Hans Umstätter. *Zeitschrift für Metallkunde,* v. 45, no. 8, Aug. 1954, p. 469-475.

Theoretical principles. Sensitive electro-acoustical method of investigating above as functions of time, temperature, wire diameter and hardness. Graphs, diagrams, photographs. 3 ref. (Q3, ST)

1026-Q. (German.) **Kinematics of Plastic Creep. Some Model Observations.** Walther Kossel. *Zeitschrift für Metallkunde,* v. 45, no. 8, Aug. 1954, p. 476-483.

Theoretical considerations of nature of slip and its relation to crystal growth. Factors which influence type and extent of slip. Diagrams. 8 ref. (Q3, Q24)

1027-Q. (German.) **Graphic Presentations of Shear-Stress Conditions in Cubic Face-Centered Crystals.** Jörg Diehl, Max Krause, Werner Offenhäuser and Wolfgang Staubwasser. *Zeitschrift für Metallkunde,* v. 45, no. 8, Aug. 1954, p. 489-492.

Means of determining axis of shear stresses from tensile deformation in any slip system and for any orientation of cubic face-centered metal crystals. Graphs, diagrams, table. (Q2, Q24, M26)

1028-Q. (Russian.) **Vibrationless Dry Surface Friction of Metals at Low Velocities.** N. F. Kunin and G. D. Lomakin. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 8, Aug. 1954, p. 1361-1366.

Relation of static and dynamic friction coefficients and connection between vibrationless friction and the dynamic coefficient of seizing for iron-copper, tin-iron and aluminum-iron pairs. Graphs, table. 10 ref. (Q9, Fe, Sn, Cu, Al)

1029-Q. (Russian.) **The Coefficient of Transverse Deformation in the Elastic Region.** A. V. Gurev. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 8, Aug. 1954, p. 1441-1447.

Experimental data show that Poisson's ratio does not change with carbon content of the steel. A new material constant is introduced based on the nonuniformity of micro-elements in the plastic state. Tables, graphs. 6 ref. (Q21, ST)

1030-Q. (Russian.) **Strength of Metals in Contact With Fused Solders.** S. T.

Kishkin, V. V. Nikolenko and S. I. Ratner. *Zhurnal Tekhnicheskoi Fiziki*, v. 24, no. 8, Aug. 1954, p. 1455-1466.

Influence of composition and contact time of various solders on brittle fracture of steels in tension. Beneficial effects of copper or nickel sublayers. Tables, graphs, diagrams, micrographs. 4 ref. (Q26, K7, ST)

1031-Q. (Pamphlet.) **Correlation of Rupture Data for Metals at Elevated Temperatures.** Report no. PB111348. 30 p. 1953. Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00.

Correlation of stress-rupture data for pure metals and alloys. Relation of time-to-rupture and test temperature and stress for several metals and alloys. (Q4)

1032-Q. (Pamphlet.) **The Correlation of High Temperature Rupture Data for Niobium.** Report no. PB 111349. 10 p. 1953. Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.00.

Prediction of rupture strength from a limited number of tests. (Q4, Cb)

1033-Q. (Book.) **Strength of Materials.** Arthur Morley. 11th Ed. 532 p. 1954. Longmans, Green and Co., Ltd., 43 Albert Drive, London, S.W. 1, England.

Fatigue, criteria of elastic strength, creep, metallurgical developments of non-ferrous metals, and use of strain energy and theorems related to it for determination of elastic deformations. (Q general)

1034-Q. Minimum Life in Fatigue. A. M. Freudenthal and E. J. Gumbel. *American Statistical Association, Journal*, v. 49, no. 267, Sept. 1954, p. 575-597.

Statistical study of probability of a specimen surviving a certain number of repetitions of a specified stress-cycle in a given testing procedure. Graphs, tables. 7 ref. (Q7)

1035-Q. Limit Analysis and Design. D. C. Drucker. *Applied Mechanics Reviews*, v. 7, Oct. 1954, p. 421-423.

Determination of load-carrying capacity of given design for machine and structural elements and assemblies. Theorems derived for an elastic ideally plastic material. 43 ref. (Q21, Q23)

1036-Q. Method of Preventing Fatigue Failure of Steel Bolts. R. H. Cross and G. M. Norris. *Engineer*, v. 198, Sept. 24, 1954, p. 410-411.

Locking two nuts together can prevent fatigue failure of a bolt in tension by effecting a reduction in the alternating load borne by the peak-loaded thread immediately inside the inner face of the inner nut. Graphs, diagrams, tables, photographs. 4 ref. (Q7, K13, ST)

1037-Q. On the Graphical Solution of Transient Vibration Problems. R. E. D. Bishop. *Institution of Mechanical Engineers, Proceedings*, v. 168, no. 10, 1954, p. 299-312; disc., p. 312-322.

Simplified approach to multi-degree-of-freedom systems leading to the treatment of transient loading of beams by moving and moving-and-varying loads. Diagrams, tables, graphs. 25 ref. (Q23)

1038-Q. Compression Wave Velocity Experiments With Copper. Jacob Savitt, R. H. Stresau and L. E. Starr. *Journal of Applied Physics*, v. 25, Oct. 1954, p. 1307-1310.

Method of measuring wave velocities in metals. Photographs, graphs. 7 ref. (Q28, Cu)

1039-Q. Quantitative Substructure and Tensile-Property Investigations of Nickel Alloys. Betsy Ancker and Earl R. Parker. *Journal of Metals*, v. 6, Oct. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Oct. 1954, p. 1155-1162.

Small-angle dislocation-boundary density of nickel and some of its alloys investigated as function of strength and results interpreted in terms of dislocation theory. Graphs, tables, micrographs. 7 ref. (Q23, Q24, Ni)

1040-Q. The Plastic Deformation of Metals. *Metallurgia*, v. 50, no. 299, Sept. 1954, p. 117-121.

Progress of research on mechanics of forming and shaping metals. Photographs, micrograph. (Q24)

1041-Q. Micro-Indentation Hardness: Its Elastic, Plastic and Fracture Components. P. Grodzinski. *Metallurgia*, v. 50, no. 299, Sept. 1954, p. 125-131.

Principles and practices in determining and defining hardness. Graphs, micrographs, diagrams, table. 26 ref. (Q29)

1042-Q. A New Instrument for Measuring Stress in Electrodeposits. Joseph B. Kushner. *Plating*, v. 41, Oct. 1954, p. 1146-1153; disc., p. 1153.

Description and theory of Stresometer. Data for various metal deposits. Diagrams, tables, graphs. 9 ref. (Q25, L17)

1043-Q. Stress in Chromium Deposits. J. E. Stareck, E. J. Seyb and A. C. Tulumello. *Plating*, v. 41, Oct. 1954, p. 1171-1180; disc., p. 1180-1182.

Details of spiral contractometer. Stresses in deposits from various baths on copper and steel. Effects of heating. Photographs, micrograph, tables, diagram, graphs. 11 ref. (Q25, L17, Cr)

1044-Q. The Influence of Metal Structure on Properties of Investment Castings. II. Nicholas J. Grant. *Precision Metal Molding,* v. 12, Oct. 1954, p. 92-95.

Value of hot molds. Photographs. (Q general, M27, E15)

1045-Q. Frictional Adhesion of Metal to Glass, Quartz, and Ceramic Surfaces. Richard B. Belser. *Review of Scientific Instruments,* v. 25, Sept. 1954, p. 862-864.

Experimental work on titanium, zirconium and other metals, applications in producing decorative designs, glass-to-metal joints, electric conductors, and in glass cutting. Tables, micrographs. (Q9, K11, Ti, Zr)

1046-Q. Design of Extensometer for Creep Studies. Ben R. Gossick. *Review of Scientific Instruments,* v. 25, Sept. 1954, p. 907-909.

An instrument which incorporates automatic and remote operation for irradiation studies over a wide range of extension for study of plastic flow under stress and deuteron bombardment. Circuit diagrams, photograph, graph. 2 ref. (Q3)

1047-Q. Radiation Effects on Structural Materials. C. R. Sutton and D. O. Leeser. Paper from "Nuclear Engineering", American Institute of Chemical Engineers, p. 208-221.

Significance of effects on mechanical and physical properties of metals in relation to design use. Diagrams, tables. 4 ref. (Q general, P general)

1048-Q. A Study of the Room Temperature Ductility of Chromium. H. L. Wain, F. Henderson and S. T. M. Johnstone. Commonwealth of Australia, Dept. of Supply, Research and Development Branch, A.R.L./MET. 1, Apr. 1954, 33 p. + 8 plates.

Effects of small amounts of nitrogen, notches, recrystallization and temperature. Tables, photograph, diagram, reflection patterns, micrographs, graph. 26 ref. (Q23, Cr)

1049-Q. Hardness of Gamma Solid Solution in the Iron-Carbon System at High Temperature. K. A. Osipov and E. M. Miroshkina. *Henry Brutcher, Altadena, Calif., Translation no.* 3332, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 94, no. 6, 1954, p. 1065-1067.)

Previously abstracted from original. See item 536-Q, 1954. (Q29, Fe)

1050-Q. Hardness of Martensite as Function of Its Carbon Content. M. Sagisman. *Henry Brutcher, Altadena, Calif., Translation no.* 3365, 5 p. (From *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, 1954, p. 271-272.)

Previously abstracted from original. See item 791-Q, 1954. (Q29, CN)

1051-Q. (English.) **The Plastic Deformation of a Crystal in a Polycrystalline Aggregate.** W. Boas and G. J. Ogilvie. *Acta Metallurgica,* v. 2, no. 5, Sept. 1954, p. 655-659.

Microscopic study shows that both interior and surface grains are deformed inhomogeneously. Data related to current theories. Micrographs. 18 ref. (Q24, Al, Cu)

1052-Q. (English.) **Elastic Properties of Iron Whiskers.** G. W. Sears, A. Gatti and R. L. Fullman. *Acta Metallurgica,* v. 2, no. 5, Sept. 1954, p. 727-728.

Unusual strength demonstrates a near-perfect crystalline structure. Micrographs. 8 ref. (Q21, M26, Fe)

1053-Q. (English.) **Torsion of a Circular Shaft Press-Fitted With a Collar.** Hideo Saito. *Technology Reports, Tohoku University,* v. 18, 1954, p. 178-186.

Mathematical analysis of stress distribution. Diagram, table, graphs. 3 ref. (Q1, Q25)

1054-Q. (English.) **On a Solution of Torsion Problem of Rectangular Cross-Section by Trefftz's Method.** Miki Ishii. *Technology Reports, Tohoku University,* v. 18, 1954, p. 187-194.

Calculation of stress distribution. Graphs, table, diagrams. 6 ref. (Q1, Q25)

1055-Q. (German.) **Hardness Measurements on Electrodeposits. II.** Albert Keil and Elisabet Merkle. *Metalloberfläche,* Ausgabe A, v. 8, no. 9, Sept. 1954, p. 129-131.

Heavy deposit of rhodium gave extreme differences in hardness between deposit and base metal. Penetration of diamond is limited for accuracy to less than 1/10 of deposit thickness. Graphs, micrograph, diagram. 9 ref. (Q29, L17, Rh)

1056-Q. (German.) **The Effect of Hydrogen on the Yield Point in Soft Steel.** Hermann Schumann. *Metallurgie und Giessereitechnik,* v. 4, no. 8, Aug. 1954, p. 367-369.

Explanation based on hypothesis of hydrogen-atom clouds. Graphs. 5 ref. (Q23, CN)

1057-Q. (German.) **Stress Measurements in Nonlinear Systems of Continuum Mechanics.** H. Schlechtweg. *Naturwissenschaften,* v. 41, no. 17, Sept. 1954, p. 400.

Stress analysis of substances deviating from Hooke's law when slightly stressed. 8 ref. (Q25, Q21)

1058-Q. (German.) **Dispersion of Double Refraction in Celluloid As a Measure of Plasticity by Photo-Elasticity.** Ernst Mönch. *Zeitschrift für angewandte Physik,* v. 6, no. 8, Aug. 1954, p. 371-375.

Degree of plastic deformation determined with aid of two isochromatic pictures. Graphs, diagram, photographs. 7 ref. (Q24, Q25)

1059-Q. (German.) **The Flow of Metals at High Temperatures.** Alfred Seeger. *Zeitschrift für Metallkunde,* v. 45, no. 9, Sept. 1954, p. 521-527.

Review of literature on effects of lattice defects on the mechanical properties of crystals. Diagrams, micrographs, table, graphs. 40 ref. (Q general, M26)

1060-Q. (German.) **Instrument for Measuring Static and Alterntaing Elongation as Well as Materials Damping.** W. Krägeloh. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 25, Sept. 1, 1954, p. 864-866.

Instrument with two strain gages for simultaneous recording of elongation, applied load and damping properties of statically or dynamically stressed materials. Circuit diagram, table, graphs, photographs, oscillograms. 4 ref. (Q8, Q25)

1061-Q. (Norwegian.) **Gases in Metals.** Nils Christensen. *Teknisk Ukeblad,* v. 101, no. 32, Sept. 9, 1954, p. 693-703.

Review of American and German literature on effects of oxygen, nitrogen and hydrogen in iron or steel on their respective properties. Methods of determining these gases in ferrous metals. Graphs, tables, photograpns. 22 ref. (Q general, S11)

1062-Q. (Russian.) **Investigation of the Relation Between the Force of Friction and "Elementary Forces".** A. V. Bulgadaev. *Doklady Akademii Nauk SSSR,* v. 97, no. 5, Aug. 11, 1954, p. 805-808.

Effects of different loads on friction between dry and lubricated surfaces of various degrees of smoothness. Graphs. (Q9)

1063-Q. (Russian.) **Optimum Microgeometry and Weight Loss Through Wear of Run-In Surfaces of a Steel-Bronze Combination.** I. A. Kosenko. *Vestnik Mashinostroeniia,* v. 34, no. 8, Aug. 1954, p. 24-25.

Effects of original condition of bearing surfaces, running-in period, temperature and coefficient of friction. Graphs. (Q9, ST, Cu)

1064-Q. (Russian.) **Variation of Mechanical Properties of Low-Carbon Steel in Relation to Conditions of Cooling After Heating.** I. A. Nenaezdnikov. *Vestnik Mashinostroeniia,* v. 34, no. 8, Aug. 1954, p. 52.

Effects of cooling rate on 0.18% carbon steel using sheet and rod specimens. Tables. (Q general, J26, CN)

1065-Q. (Russian.) **Fatigue Strength of Steel Surface-Hardened by High-Frequency Heating by Mechanical and Tube Generators.** P. A. Lankin. *Vestnik Mashinostroeniia,* v. 34, no. 8, Aug. 1954, p. 53-55.

Effects of induction heating variables and prior structure on mechanical properties of carbon steel. Diagrams, photographs, table. 6 ref. (Q7, J2, CN)

1066-Q. (Russian.) **Effect of Shot-Peening on the Endurance Limits of Specimens Subjected to Repeated Shock Loads.** M. A. Anuchin and Iu. A. Volkov. *Vestnik Mashinostroeniia,* v. 34, no. 8, Aug. 1954, p. 55-58.

Effects of shot-peening variables on strength of polished and unpolished specimens of alloy steel. Graphs, tables. 2 ref. (Q7, G23, AY)

1067-Q. (Russian.) **Effect of Hardening by High-Frequency Current Upon the Strength of Splined Joints During Twisting.** N. I. Pliuksne. *Vestnik Mashinostroeniia,* v. 34, no. 8, Aug. 1954, p. 59-61.

Torsion test data for various spline shapes. Tables, graphs, diagrams, photographs. (Q1, J2, ST)

1068-Q. (Russian.) **Relation Between Temperature and the Decrement of Vibrations and the Modulus of Elasticity of Some Steels.** M. M. Pisarevskii. *Vestnik Mashinostroeniia,* v. 34, no. 8, Aug. 1954, p. 61-65.

Experimental data for steels with various heat treatments. Graphs, table. 3 ref. (Q21, ST)

1069-Q. (Russian.) **Heat Treatment and Creep Strength of Steel 1X13.** S. K. Maksimov. *Vestnik Mashinostroeniia,* v. 34, no. 8, Aug. 1954, p. 65-67.

Composition, mechanical properties and microstructure of 14% chromium steel. Tables, graphs, micrographs. 3 ref. (Q3, J general, M27, SS)

1070-Q. **Stress-Rupture Properties of Some Chromium-Nickel Stainless-Steel Weld Deposits.** R. D. Wylie, C. L. Corey and W. E. Leyda. *ASME Transactions,* v. 76. Oct. 1954, p. 1093-1104; disc., p. 1104-1106.

High-temperature strength capacity of chromium-nickel stainless steel welded joints in power-boiler

equipment. Tables, diagrams, graphs, micrographs. 9 ref. (Q4, SS)

1071-Q. Radioactive Isotopes for Measuring Piston Ring Wear. J. H. Deterding and A. Dyson. *Engineer,* v. 198, Oct. 1, 1954, p. 442-445.

Raidoactive constituents; safety precautions; counting methods. Photographs, graphs, diagram, table. 2 ref. (Q9)

1072-Q. Determination of Loads in the Presence of Thermal Stresses. Samuel Levy. *Journal of the Aeronautical Sciences,* v. 21, Oct. 1954, p. 659-664.

Equations for determining axial load, shear load and bending moment from the output of gages located at specified positions on aircraft structures. Diagrams. 2 ref. (Q25)

1073-Q. The Creep of Aluminium During Neutron Irradiation. E. R. W. Jones, W. Munro and N. H. Hancock. *Journal of Nuclear Energy,* v. 1, Aug. 1954, p. 76-86 + 1 plate.

Includes photographs, diagrams, table, graphs. 3 ref. (Q3, P10, Al)

1074-Q. Brittle Failure of Steel Structures—Factors of Importance. M. E. Shank. *Metal Progress,* v. 66, Oct. 1954, p. 120-126.

Brittle fractures in steel plate structures result from a combination of stress (residual, locked-in, thermal or working—not necessarily impact), stress concentration and triaxiality at notches, cracks or defects in workmanship, and steel of composition, microstructure and treatment which gives a high transition temperature for tough-to-brittle type of fracture. Photograph, table, graphs. 5 ref. (Q26, Q23, ST)

1075-Q. Hydrogen Embrittlement of a Titanium Alloy. R. J. Kotfila and E. F. Erbin. *Metal Progress,* v. 66, Oct. 1954, p. 128-131.

Recent failures of titanium alloy components have been ascribed to hydrogen, and it is demonstrated here that this interstitial element lowers the tensile ductility of the 3% manganese complex alloy, the effect becoming most pronounced with decreasing strain rate at room temperature. Graphs. (Q23, Ti)

1076-Q. A Comparative Investigation on the Influence of Sheet Thickness, Type of Rivet and Number of Rivet Rows on the Fatigue Strength at Fluctuating Tension of Riveted Single Lap Joints of 24ST-Alclad Sheet and 17S Rivets. A. Hartman. *Netherlands Nationaal Luchtvaartlaboratorium Report* M.1943, Feb. 1954, 34 p.

NACA rivets were superior to snap and countersunk V-rivets at high loads. Thickness had no effect except at high loads with NACA rivets. Tables, graphs, diagrams. 1 ref. (Q7, K13, Al)

1077-Q. Static Tests and Fatigue Tests on Redux-Bonded Built-Up and Solid Light-Alloy Spar Booms. A. Hartman and J. H. Rondeel. *Netherlands Nationaal Luchtvaartlaboratorium Report* M.1936, Feb. 1954, 10 p. + 9 plates.

Bending fatigue of solid spar booms was superior, probably due to superiority of unclad material. Photographs, micrographs, tables, graphs, diagrams. 2 ref. (Q7, Al)

1078-Q. Buckling and Moment Table for Steel Beams. L. P. Hollingsworth. *Product Engineering,* v. 25, Oct. 1954, p. 211, 213, 215.

Table simplifies selection of most economical shape for a given application. Tables, diagram. (Q28, ST)

1079-Q. Temperature-Compensated Strain Gages. Alvin B. Kaufman. *Radio-Electronic Engineering,* v. 23, Nov. 1954, p. 20, 36.

New gages for measurements at high temperatures without compensating circuits. Circuits, graphs. 2 ref. (Q25)

1080-Q. An Experimental and Theoretical Investigation of the Anisotropy of 3S Aluminum-Alloy Sheet in the Plastic Range. Arthur J. McEvily, Jr., and Philip J. Hughes. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3248, Oct. 1954, 45 p.

Tension, compression and X-ray test data show anisotropy and preferred orientation. Theoretical analysis checked by data on copper. Tables, micrographs, drawings, photograph, graphs. 12 ref. (Q24, Al, Cu)

1081-Q. Some Observations on the Tertiary Stage of Creep of High-Purity Aluminium. G. R. Wilms. Commonwealth of Australia, Dept. of Supply, Defence Standards Laboratories Report 199, Jan. 1954, 13 p.

Structural changes are caused by deformation but do not influence creep rate. Intercrystalline fissures may be cause of increased strain rate. Graphs, micrographs, diffraction patterns. 11 ref. (Q3, Al)

1082-Q. (English.) **The Torductor and the Pressductor, Two Magnetic Stress-Gauges of New Type.** Orvar Dahle. *IVA Tidskrift for Teknisk-Vetenskaplig Forskning,* v. 25, no. 5, 1954, p. 221-238.

Illustrates uses for these rugged

detectors which require no electronic amplification. Graphs, photographs, diagrams. 4 ref. (Q25)

1083-Q. (English.) **Study of Cold-Working by Microfocussing X-Ray. I. Fine Structure of Laue Spot.** Tomiya Sutoki and Koichi Nakajima. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 3, June 1954, p. 244-252.

With repeated old working and successive annealing at low temperatures the spot structure of aluminum single crystals remained lamellar but with high temperatures an irregular, complicated structure developed. Diagrams, photographs. 5 ref. (Q24, M26, Al)

1084-Q. (French.) **A Study of the Annealing of Rolled Uranium.** G. Cabane and J. Petit. *Revue de métallurgie,* v. 51, no. 9, Sept. 1954, p. 603-612; disc., p. 612-613.

Deformation proceeds by both twinning and slip causing differences in annealing behavior. Table, graphs, micrographs, diffraction patterns. 10 ref. (Q24, J23, U)

1085-Q. (German.) **Research on the Effect of Heating on Cold Working and Internal Stresses.** Karl Wellinger and Ernst Keil. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 8, Aug. 1954, p. 264-268.

Long-time tensile and torsion tests on boiler steel in the as-delivered and the stretched state (20% elongation) at 350 to 500° C. Tables, diagrams, graphs. 1 ref. (Q25, CN)

1086-Q. (Russian.) **Dynamic Stresses in a Mine Hoisting Cable. Lifting Load.** G. N. Savin. *Doklady Akademii Nauk SSSR,* v. 97, no. 6, Aug. 21, 1954, p. 991-994.

Mathematical stress analysis. 4 ref. (Q25)

1087-Q. (Russian.) **Onset of Flow During Torsion of Metallic Crystals.** P. I. Kuleshov. *Doklady Akademii Nauk SSSR,* v. 97, no. 6, Aug. 21, 1954, p. 1015-1018.

Creep limit and slip equations of cubic and hexagonal crystals. Table, graphs. 2 ref. (Q1, Q24, Al, Cu)

1088-Q. (Russian.) **Influence of Chromium on Bond Strength in Crystals of Alpha-Iron.** V. K. Kritskaia, G. V. Kurdiumov and T. I. Stelletskaia. *Doklady Akademii Nauk SSSR,* v. 98, no. 1, Sept. 1, 1954, p. 63-66.

Influence of deformation, composition and heat treatment on molecular bonding. Tables, graphs. 4 ref. (Q23, Fe, Cr)

1089-Q. (Russian.) **Effect of Surface Defects Upon Fatigue Strength of Crankshafts Made of Magnesium Cast Iron.** I. V. Kudriavtsev and N. A. Balabanov. *Liteinoe Proizvodstvo,* 1954, no. 6, Sept., p. 18-20.

Endurance limits of pearlitic and ferritic magnesium cast irons and one steel compared for roll-burnished and unburnished crankshafts. Other mechanical properties. Diagrams, graph, tables, 6 ref. (Q7, CI)

1090-Q. **Grain-Boundary Movement, Slip, and Fragmentation During Creep of Aluminium-Copper, Aluminium-Magnesium, and Aluminium-Zinc Alloys.** D. McLean and M. H. Farmer. *Institute of Metals, Journal,* v. 83, Sept. 1954, p. 1-10 + 2 plates.

Tests show that slip and grain-boundary displacement occur concurrently. Magnitude of ratio depends on test conditions. Tables, graphs, micrographs, reflection patterns. 32 ref. (Q24, Q3, Al)

1091-Q. **Fatigue Phenomena in High-Strength Aluminium Alloys.** R. F. Hanstock. *Institute of Metals, Journal,* v. 83, Sept. 1954, p. 11-15 + 2 plates.

Influence of precipitation on fatigue strength. Diagram, graphs, photograph, micrographs, table. 1 ref. (Q7, N7, Al)

1092-Q. **The Formation and Removal of Twins in Titanium During Deformation.** A. T. Churchman. *Institute of Metals,* Journal, v. 83, Sept. 1954, p. 39-40 + 2 plates.

Twins in single crystals formed by bending can be removed by unbending or by annealing. Micrographs. 19 ref. (Q24, Ti)

1093-Q. **New Super-High Strength Structural Steels.** A. E. Nehrenberg. *Materials & Methods,* v. 40, Oct. 1954, p. 100-103.

Developed to improve strength-weight ratio of aircraft components and can be heat treated to strength levels of 200,000 to 300,000 psi Graphs, tables, photograph. (Q23, J general, AY)

1094-Q. **Relative Strengths and Densities of Some Engineering Materials.** *Materials & Methods,* v. 40, Oct 1954, p. 143.

Data sheet on mechanical and physical properties of some metals, plastics, wood and ceramic materials. (Q23, P10)

1095-Q. **The Practical Appraisal of Stress Raisers in Design.** *Mechanical World and Engineering Record,* v. 134, Oct. 1954, p. 462-464.

Elimination of stress raisers is a matter of design and production technique. Diagrams, table. (Q25)

1096-Q. Fatigue of Lead and Lead Alloys. J. McKeown. *Metal Industry*. v. 85, Oct. 8, 1954, p. 305-306.

Equipment and technique for accelerated testing. Relationship of dynamic strength and endurance limit. Photograph, graph, 1 ref. (Q7, Pb)

1097-Q. How Stresses Are Affected by Branch Connections. E. D. Abraham and G. M. McClure. *Pipe Line Industry*, v. 1, Sept. 1954, p. 60, 62-64.

Determination of maximum stresses, direction of principal stresses and over-all distortion of each connection under internal pressure in unreinforced branch connections and their effect on design of piping systems for gas transmission. Diagrams, photograph. (Q25)

1098-Q. Crack-Starter Tests of Ship Fracture and Project Steels. P. P. Puzak, M. E. Schuster and W. S. Pellini. *Welding Journal*. v. 33, Oct. 1954, p. 481S-495S.

Fracture propagation data for rimmed, semikilled and killed steels over range of service temperatures. Photographs, graphs, diagrams, tables. 17 ref. (Q26, CN)

1099-Q. Effects of Prestressing on Fatigue Strength of Spot-Welded Stainless Steels. Andre Choquet, V. N. Krivobok and Georges Welter. *Welding Journal*, v. 33, Oct. 1954, p. 509S-523S.

Hydrostatic compression gives greatest improvement. Significant gains are produced by simple compression, tension or hand peening. Graphs, diagrams, photographs, tables, micrographs. (Q7, K3, SS)

1100-Q. On the Formation of Hot Tears. V. G. Lyuttsau. *Henry Brutcher, Altadena, Calif., Translation no.* 3374, 7 p. (From *Liteinoe Proizvodstvo*, v. 5, no. 2, 1954, p. 16-18.)

Origin and development of hot tears and their relation to alloy composition. Significance of temperature and crystallization range on hot tear susceptibility. Tables, micrographs, diagrams, graphs. 2 ref. (Q26)

1101-Q. (English.) **Buckling of Stressed Bars of Heterogeneous Materials.** P. Csonka. *Acta Technica Academiae Scientiarum Hungaricae*, v. 9, nos. 3-4, 1954, p. 391-403.

Stress analysis studies of concentrically-loaded builtup members. Diagrams, graphs. 5 ref. (Q28, Q25)

1102-Q. (English.) **The Effect of Various Fits on the Fatigue Strength of Pin-Hole Joints.** A. Hartman and F. A. Jacobs. *Netherlands Nationaal Luchtvaartlaboratorium Report* M.-1946, Apr. 1954, 6 p. + 21 plates.

Pin-hole joints with a steel pin diameter of 10 or 6 mm. through 24ST Alclad sheet investigated for endurance from 10^4 to 5.10^7 load reversals. Tables, diagrams, graphs. 3 ref. (Q7, Al)

1103-Q. (English.) **A Theory of the Formation of Slip Bands in Face-Centered Cubic Crystals.** Hideji Suzuki. *Physical Society of Japan, Journal*, v. 9, no. 4, July-Aug. 1954, p. 531-540.

Three concepts used to explain multiplication of dislocations and differences between surface structures of abraded and unabraded crystals. Diagrams. 34 ref. (Q24)

1104-Q. (French.) **Stress Analysis. Measuring Stresses by Resistance Strain Gages.** R. Vessereau. *Chaleur & Industrie*, v. 35, no. 350, Sept. 1954, p. 241-255.

Description of gages, production problems, applications. Diagrams, photographs. (Q25)

1105-Q. (French.) **Photo-Elastic Stress Analysis, Work of the Société Nationale des Etudes et des Constructions des Moteurs d'Aviation.** R. Fleury and J. F. Zandman. *Docaero; revue documentaire de la technique aéronautique mondiale*, 1954, no. 29, p. 35-42.

Theoretical basis, procedure and applications. Photograph, charts. (Q25)

1106-Q. (French.) **Generalized E. Dübi Hardness Characteristics.** Albert Collaud. *Fonderie*, 1954, no. 104, Sept., p. 4119-4127.

Relationships of graphite content and Brinell hardness to other mechanical properties of gray cast iron. Photographs, drawings, charts, micrographs. 5 ref. (Q29, CI)

1107-Q. (German.) **Residual Stresses in Built-Up Cylindrical Elements.** Hans Bühler. *Schweissen und Schneiden*, v. 6, no. 9, Sept. 1954, p. 370-372.

Compositions and mechanical properties of investigated steels, determination of internal stresses by drilling and changes in length and diameter. Tables, graphs. 11 ref. (Q25, K general, CN)

1108-Q. (German.) **The Gripping of Cylindrical Tensile-Test Specimens With Glass-Smooth Surfaces.** H. Isken. *Sprechsaal*, v. 87, no. 19, Oct. 1954, p. 479-481.

Use of mixture to be cast into a cone jacket to hold smooth specimens. Diagrams, graph. (Q27)

1109-Q. (German.) **Theory of Crystal Plasticity. I. Fundamentals of the Theory.** Alfred Seeger. *Zeitschrift für Naturforschung,* v. 9a, no. 9, Sept. 1954, p. 758-775.

Outline of a theory deviating considerably from accepted concepts of critical shearing stress and creep. Practical tests for the new concepts. Graphs, diagrams, table. 97 ref. (Q23)

1110-Q. (Spanish.) **Advances in the X-Ray Method for the Determination of Residual Stresses.** A. Priegue Guerra. *Ciencia y técnica de la Soldadura,* v. 4, no. 19, July-Aug. 1954, 7 p.

Use of Geiger counter to measure X-ray diffraction of plastically deformed AISI 52100 steel. Photographs, diagrams, tables. (Q25, AY)

1111-Q. (Book.) **SAE Transactions,** (Annual Volume), v. 62, 1954, 656 p. Society of Automotive Engineers, Inc., 29 West 39th St., New York 18, N. Y.

Consists of 54 papers, five of which are individually abstracted.
(Q general)

1112-Q. (Book.) **The Steel Skeleton.** J. F. Baker. **v. I. Elastic Behavior and Design.** 206 p. 1954. Cambridge University Press, Bentley House N.W.1., London, England. $8.50.

Stress analysis on experimental frameworks and on existing buildings. Behavior of various joints and beam constructions.
(Q25, Q21, T25, ST)

1113-Q. (Book.) **Strength and Resistance of Metals.** John M. Lessells. 450 p. 1954. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $10.00.

Takes into account all the various stress conditions encountered in engineering applications such as static tension or compression, creep at elevated temperature, cyclically varying stresses as in fatigue, suddenly applied loads as in impact, and high surface stresses as in wear.
(Q general)

1114-Q. (Book.) **Theoretical Elasticity.** A. E. Green and W. Zerna. 442 p. 1954. Oxford University Press, Amen House, London E.C.4, England; also 114 Fifth Ave., New York 11, N. Y. $6.75.

The general theory of finite elastic deformations; complex variable methods for two-dimensional problems for isotropic and aeolotropic bodies; and the shell theory. (Q21)

1115-Q. (Pamphlet.) **Hot Hardness Testing of Chromium Base Alloys.** H. T. Greenaway. Commonwealth of Australia, Dept. of Supply, Aeronautical Research Laboratories, Report SM. 195, June 1952, 11 p. + 9 plates.

Dynamic hot hardness tester for use up to 1000° C. Experimental data for chromium-tungsten, chromium-titanium and chromium-beryllium alloys. Diagram, graphs, micrographs. 7 ref.
(Q29, Cr, W, Ti, Be)

SECTION R

CORROSION

1-R. Some Observations on the Mechanism of Pitting Corrosion. R. May. *Institute of Metals, Journal,* v. 82, Oct. 1953, p. 65-74.

Nature of corrosion products, causes and controlling factors using copper specimens. Diagrams. 1 ref. (R2, Cu)

2-R. Symposium on Control of Internal Corrosion of Tankers. I. The Nature of Corrosion and Its Control. William B. Jupp. **II. Inhibitors in Cargo.** J. V. C. Malcolmson, W. S. Quimby, Gwendolyn D. Pingrey and J. C. D. Oosterhaut. **III. Corrosion Control in Practice.** A. B. Kurz. *Corrosion,* v. 9, Nov. 1953, p. 387-410; disc., p. 410-424.

Tables, graphs, diagrams. 13 ref. (R general, CN)

3-R. Cable Sheath Corrosion and Prevention. B. B. Reinitz. *Corrosion,* v. 9, Nov. 1953, p. 425-430; disc., p. 431.

Causes of corrosion in lead sheaths and possibilities of prevention by means of cathodic protection and neoprene coverings. Photographs, diagrams, tables. 24 ref. (R1, R10, Pb)

4-R. Radiography as an Aid in Corrosion Studies. H. A. Liebhafsky and A. E. Newkirk. *Corrosion,* v. 9, Nov. 1953, p. 432-435.

X-ray technique used to determine corrosion on three types of stainless steel by ferric-chloride solution. Radiographs. (R11, SS)

5-R. Some Corrosion Hazards From DC Welding Currents. H. W. Wahlquist. *Corrosion (News Section),* v. 9, Nov. 1953, p. 1.

Methods of connecting welding machines to large construction projects to eliminate or reduce corrosion or pitting on adjoining structures. Diagrams. (R1, K1)

6-R. Observations on Three Non-Tarnishing Ferrous Alloys. A. A. Krishman. *Journal of Scientific & Industrial Research,* v. 12, sec. A, Sept. 1953, p. 451-453.

Results of corrosion tests on iron-aluminum-manganese alloys. Micrographs, tables. (R11, Fe)

7-R. Three Accelerated Corrosion Tests for Materials and Finishes. Sam Tour. *Materials & Methods,* v. 38, Nov. 1953, p. 110-113.

Equipment and methods for making simulated service tests. Includes testing by alternate condensation, wear-corrosion and salt water. Photographs. (R11)

8-R. Structures in the Sea. M. B. Willey. *Petroleum Engineer,* v. 25, Nov. 1953, p. B38, B41, B43-B44, B47.

How wind, waves, and corrosion present special problems in design of offshore drilling platforms. Photographs. 7 ref. (R3, R4, ST)

9-R. Corrosive Action on Steel by Gases Dissolved in Water. J. Wade Watkins and Jack Wright. *Petroleum Engineer,* v. 25, Nov. 1953, p. B50-B51, B53, B55, B57.

Equipment corrosion in secondary recovery of petroleum shown to be accelerated by action of gases dissolved in injected water. Photograph, graphs, diagram. 8 ref. (R4, ST)

10-R. Oxides of Zirconium. (Digest of "The Corrosion of Zirconium", by L. E. Colteryahn, W. Joseph, W. E. Ray and H. J. Read; *U. S. Atomic Energy Commission Report* NTO-887.) *Metal Progress,* v. 64, Nov. 1953, p. 124, 126.

Efforts to study the growth mechanisms of the corrosion products on zirconium. (R2, Zr)

11-R. (French.) **Study of the Oxidation of High-Purity Iron and the Man-**

ner of Decomposition of the Monoxide Phase of Iron. R. Collongues, R. Sifferlen and G. Chaudron. *Revue de métallurgie,* v. 50, no. 10, Oct. 1953, p. 727-735; disc., p. 735-736.

Structure of oxide films. The role of impurities in the mechanism of oxidation. Various mechanisms of the decomposition of the iron oxide phase. Graphs, micrographs. 11 ref. (R2, Fe)

12-R. (German.) **Corrosion of Lead. Dissolution as a Function of Time.** W. Katz. *Metalloberfläche,* Ausgabe A, v. 7, no. 11, Nov. 1953, p. 161-166.

Results of experiments with neutral, acid and alkali solutions. Details of the experiments. Results compared with those from electrochemical measurements. Graphs, micrographs. 5 ref. (R2, Pb)

13-R. The Rate of Dissolution of Zinc and Cadmium in Chromic Chloride Solutions. Cecil V. King and Natalie Mayer. *Electrochemical Society, Journal,* v. 100, Nov. 1953, p. 473-479.

Experimental study of factors affecting the above, including form of chromic ion present, pretreatment of metal surface, and in some solutions, acidity. Graphs, table. 15 ref. (R6, Cd, Cr, Zn)

14-R. Corrosion. How Best to Study It. *Metal Progress,* v. 64, Dec. 1953, p. 100, 170, 172-174.

Includes "For More Fundamental Research"; John Chipman, and "A Defense of Ad Hoc Studies", Frank L. LaQue. Relative merits of fundamental and empirical studies. (R general)

15-R. Corrosion Tests for Liquid Metals, Fused Salts at High Temperatures. D. C. Vreeland, E. E. Hoffman, and W. D. Manly. *Nucleonics,* v. 11, Nov. 1953, p. 36-39.

Static and dynamic tests used to determine reactions between possible heat transfer and container materials for nuclear applications. (R11, T25)

16-R. Filiform Corrosion. M. Van Loo, D. D. Laiderman and R. R. Bruhn. *Paint, Oil & Chemical Review,* v. 116, Dec. 3, 1953, p. 20-22, 30-34.

Examples. Conditions conducive to filiform growth defined. Theoretical explanation involving initiating, driving, and directing mechanisms. Suggests improvements. Photographs, diagram, tables. (R1)

17-R. Progress Report on Development of a New Accelerated Corrosion Test. W. L. Pinner. *Plating,* v. 40, Dec. 1953, p. 1376-1378, 1383; disc., p. 1384.

Progress report of a committee project set up in 1951 by the AES. Table. (R11)

18-R. Corrosion Studies at the Institute. *Tin and Its Uses,* 1953, no. 29, p. 1-5.

Corrosion resistance of tin and its alloys to sea water and weathering conditions. Photographs. (R4, R3, Sn)

19-R. (German.) **The Behavior of Alkali Hydrogen Fluorides. The Hydrogen Fluoride Mixture "WB_4" in the Presence of Iron.** Bruno Schulze. *Werkstoffe und Korrosion,* v. 4, no. 10, 1953, p. 349-356.

Experiments and results on corrosive effects of potassium acid fluoride and ammonium acid fluoride on iron at 20 and 80° C. Graphs, photographs, tables. 12 ref. (R6, Fe)

20-R. (Italian.) **Electrode Polarization and Its Utilization in the Evaluation of Inhibitors.** G. Bombara. *Rivista dei Combustibili,* v. 7, no. 9, Sept. 1953, p. 527-546.

Causes of electrochemical differentiation of a metallic surface into anodic and cathodic areas. Diagrams, graphs. 6 ref. (R10)

21-R. (Russian.) **Photographically Active Particles Evolved by Metals During Atmospheric Corrosion.** I. L. Roikh and D. M. Rafalovich. *Doklady Akademii Nauk SSSR,* v. 90, no. 4, June 1, 1953, p. 603-606.

Metals liberate molecules of hydrogen peroxide in the course of atmospheric corrosion. Graphs. 7 ref. (R3)

22-R. (Russian.) **Influence of Temperature on Rate of Corrosion of Aluminum and Certain Aluminum Alloys.** G. V. Akimov and V. V. Romanov. *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 281-283.

Tests on aluminum-copper alloys, aluminum-magnesium alloys and commercially pure aluminum. Graphs. 3 ref. (R general, Al, Cu, Mg)

23-R. (Russian.) **New Principle in the Investigation of Atmospheric Corrosion of Metals.** I. L. Rozenfel'd and T. I. Pavlutskaia. *Doklady Akademii Nauk SSSR,* v. 91, no. 2, July 11, 1953, p. 315-317.

Hypothesis on the possibility of the existence of corrosion elements having considerable differences in potential. Graphs. 2 ref. (R3)

24-R. (Russian.) **Kinetics of High-Temperature Oxidation of Selenium-Bearing Copper.** N. P. Diev, M. J. Kochnev, A. F. Plotnikova and T. N. Zaidman. *Zhurnal Prikladnoi Khimii,* v. 26, no. 6, June 1953, p. 596-604.

Addition of selenium to copper alloys increases the oxidation rate in the temperature range of 600-1000° C. Diagrams, graphs, tables. 12 ref. (R2, Cu)

25-R. (Russian.) **Corrosion of Iron in Contact With Gasoline or Kerosene and With an Aqueous Solution of an Electrolyte Containing Potassium Chromate Additives.** I. V. Krotov and T. M. Khachadurova. *Zhurnal Prikladnoi Khimii,* v. 26, no. 6, June 1953, p. 605-611.

Potassium chromate can be used as a corrosion inhibitor only when the water phase is a very weak electrolyte. Tables, graphs. 6 ref. (R10, Fe)

26-R. (Russian.) **Factors Influencing the Rusting of Precision Steel Parts During Manufacturing Process.** V. V. Skorchelletti and V. E. Piskorskii. *Zhurnal Prikladnoi Khimii,* v. 26, no. 7, July 1953, p. 730-735.

Influence of relative humidity, temperature, and contact with air containing SO_2 on rate of rust spot generation was demonstrated by laboratory experiments. Graphs. (R3, ST)

27-R. (Book.) **Cathodic Protection of Pipelines and Storage Tanks.** V. A. Pritula. 1953. Her Majesty's Stationery Office, London, England. 10s. 6d.

Translated from the Russian. Deals with theory of the subject and practical details on methods. (R10, CN)

28-R. Durimet 20—Carpenter 20. Walter A. Luce. *Chemical Engineering,* v. 60, Dec. 1953, p. 276, 278, 288.

Charts corrosion rates in a number of chemicals. Mechanical properties and some applications in the chemical industry. Photographs, tables, charts.
(R11, Q general, T29, SG-g)

29-R. Cathodic Protection and High Resistivity Soil. H. C. Van Nouhuys. *Corrosion,* v. 9, Dec. 1953, p. 448-458; disc., p. 458-459.

Pipeline system of 25 rectifiers in high-resistivity soils. Comparative tests between magnesium anodes and rectifiers. Photographs, maps, graphs, tables. 7 ref. (R10)

30-R. Corrosion of Steel in Dilute Solutions of Sodium Salts of Weak Acids. M. J. Pryor. *Corrosion,* v. 9, Dec. 1953, p. 467-477.

Rate and form of corrosion of steel in dilute solutions of anodic inhibitors. Photograph, tables, graphs. 19 ref. (R5, CN)

31-R. The Reaction of Silver Alloys With Sulfur in Mineral Oil. I. Kinetics. R. T. Foley, M. J. Bolton and W. Morrill. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 538-542.

Traces course of reaction of silver alloys with sulfur to determine the mechanism of tarnishing. Typical reaction course consisted of an initial rapid reaction similar to unalloyed silver followed by a linear steady-state phase. Graphs, tables. 10 ref. (R2, Ag)

32-R. Mechanism of Reaction of Aluminum and Aluminum Alloys With Carbon Tetrachloride. Milton Stern and Herbert H. Uhlig. *Electrochemical Society, Journal,* v. 100, Dec. 1953, p. 543-552.

Proposes a reaction mechanism. Effects of alloying elements on induction period and corrosion rate. Diagram, graphs, tables. 17 ref. (R6, Al)

33-R. The Inhibition by Quinolines and Thioureas of the Acid Dissolution of Mild Steel. T. P. Hoar and R. D. Holliday. *Journal of Applied Chemistry,* v. 3, Nov. 1953, p. 502-513.

Dissolution of mild steel by warm sulphuric acid, with and without organic inhibiting additions, studied by simultaneous measurements of corrosion rate and corrosion potential, and by the determination of true anodic and cathodic polarization curves in the neighborhood of the natural corrosion potential. Graphs, diagrams. 25 ref. (R5, CN)

34-R. Corrosion in Refrigeration Systems Can Be Controlled. R. G. Rydell. *Refrigerating Engineering,* v. 61, Dec. 1953, p. 1330-1332, 1370-1372.

Water factors that produce corrosion and chemicals that will reduce or prevent it. Graphs, tables. (R4)

35-R. (Hungarian.) **The Effects of Grain Refining Additions and Alloying With Magnesium Upon Corrosion Resistance of High-Purity Aluminum.** Maria H. Gyenes. *Aluminium (Budapest),* v. 5, no. 11, Nov. 1953, p. 225-235.

Results of investigations with various highly corrosive media compared with data from literature. Tables, graphs, photograph. 24 ref. (R general, Al)

36-R. (Hungarian.) **Protection Against Corrosion of Pipelines.** Ferenc Zachemski. *Banyaszati Lapok,* v. 8, no. 11, Nov. 1953, p. 559-565.

Corrosion and protection of a Hungarian pipeline built in 1940-42. Examination, onset of corrosion, its course and repairs effected, causes of corrosion, galvanic reactions and measures against them. Tables, diagrams, graphs. 7 ref. (R10, AY)

37-R. (Russian.) **Catalytic Corrosion.** S. Z. Roginskii, I. I. Tret'iakov, and A. B. Shekhter. *Doklady Akademii Nauk SSSR,* v. 91, no. 4, Aug. 1, 1953, p. 881-884 + 1 plate.

External effect of catalytic and sorption corrosion on surface structure. Table, micrographs. 7 ref. (R1)

38-R. Cooling System Corrosion Problems. R. S. Wise. *Diesel Power,* v. 31, Dec. 1953, p. 64-66.

Use of corrosion inhibitors in water-cooled diesel engines. Photographs, diagram. (R10)

39-R. There's Trouble Ahead if Utilities Fail to Coordinate Their Corrosion Control Measures. Hugh L. Hamilton. *Gas,* v. 29, Dec. 1953, p. 51-52.

(R general)

40-R. Cathodic Protection of Ferrous Metals. Heinrich Klas. *Metal Progress,* v. 65, Jan. 1954, p. 142-144.

Previously abstracted from *Stahl und Eisen.* See item 439-R, 1953. (R10, ST, CI)

41-R. Fight Corrosion. Profit From Your Own Experience. *Petroleum Processing,* v. 8, Dec. 1953, p. 1866-1869.

Broadened program of corrosion prevention, including better correlation of corrosion data, extended inspection of metals and avoidance of corrosion potentialities by design engineers. Charts. (R general)

42-R. Coordination of Corrosion Control. Hugh L. Hamilton. *Pipe Line News,* v. 25, Dec. 1953, p. 44, 46, 48.

Steps necessary for adequate coordination of corrosion. (R general)

43-R. (Italian.) **Corrosion by Differential Aeration. Research on Zinc.** G. Bianchi. *Metallurgia italiana,* v. 45, no. 9, Sept. 1953, p. 323-327.

Process can be controlled by diffusion of oxygen in the solution or by anodic control. Diagrams, photographs, graphs, table. 4 ref. (R10, Zn)

44-R. (Polish.) **Corrosion in Coke By-Products Industry.** H. Wolk-Laniewska. *Przemysl Chemiczny,* v. 9, no. 9, Sept. 1953, p. 486-491.

Various methods which require coordination for improvement of corrosion control. Tables, photographs, micrographs. (R general)

45-R. (Russian.) **Passivation and Activation of Magnesium in an Alkaline Solution.** E. V. Barelko and B. N. Kabanov. *Doklady Akademii Nauk SSSR,* v. 90, no. 6, June 21, 1953, p. 1059-1062.

Tests made on 99.95% pure magnesium with chemically pure potassium hydroxide in distilled water. Graphs. 6 ref. (R10, Al)

46-R. (Spanish.) **Corrosion Test for Corrosion-Resistant Cr-Ni Austenitic Welded Steels (Proposal Drawn Up by the Commission 9 on Weldability of the International Welding Institute).** *Ciencia y técnica de la Soldadura,* v. 111, no. 14, Sept.-Oct. 1953, 2 p.

Outlines test for determining susceptibility of welded stainless steels to intercrystalline corrosion. Diagrams. (R11, K general, SS)

47-R. Mechanism of the Internal Corrosion of Water Pipe. Rolf Eliassen and James C. Lamb, III. *American Water Works Association, Journal,* v. 45, Dec. 1953, p. 1281-1294.

Effects of several variables and requirements for further research. Diagrams, graphs, tables. 9 ref. (R1)

48-R. Corrosion Proofing Vapour Phase Inhibitors. John P. Mosher. *Canadian Chemical Processing,* v. 37, Dec. 1953, p. 64.

Types, effects and applications of inhibitors. (R10)

49-R. New Techniques and Current Problems in Control of Underground Corrosion. O. C. Mudd. *Gas Age,* v. 112, Dec. 17, 1953, p. 46-51, 77-78. (Taken from paper presented before Pipe Line Symposium, American Petroleum Institute, Chicago, Ill. Nov. 10, 1953.)

Construction features, accessory equipment and choice of coatings. Diagrams, graphs, table. (R8)

50-R. (Book.) **Symposium on Fretting Corrosion.** 84 p. 1953. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $2.75.

A compilation of papers presented by W. E. Campbell; J. R. McDowell; Oscar J. Horger; E. W. Herbek, Jr., and R. F. Stohesher; H. H. Uhlig; W. D. Tierney; and A. W. McClellan. (R1)

51-R. (Book.) **Water Treatment.** 192 p. 1953. Houseman & Thompson, Ltd., D. M. House, Newcastle Upon Tyne, 2, England. 15s. ($2.25.)

Scales, deposits, pitting, and corrosion with their analyses and the analyses of the waters that caused them. (R4, R10)

52-R. Corrosive Effects of De-Icing Salts. Progress Report of NACE Technical Practices Committee 19 on Corrosion by De-Icing Salts. *Corrosion,* v. 10, Jan. 1954, p. 3-6.

De-icing salt used in cities in Northern part of the United States is estimated to cause an added $100,000,000 annual loss to automobiles and buried pipes and cables. Methods of testing effect of salts on steel. Suggests mitigation practices. 21 ref. (R6)

53-R. Corrosion by Acids at High Temperatures. R. F. Miller, R. S. Treseder and A. Wachter. *Corrosion,* v. 10, Jan. 1954, p. 7-12; disc., p. 12.
Simple test method for obtaining corrosion data with acids and other corrosives at temperatures above their normal boiling points. Diagrams, tables, graphs. 4 ref. (R5)

54-R. Corrosion Testing by Measurement of Local Cell Potentials. J. K. Rice. *Corrosion,* v. 10, Jan. 1954, p. 25-29; disc., p. 29.
Method of measurement which uses rotating electrode and stationary microprobe reference electrode. Diagrams, graphs, photographs. 4 ref. (R11)

55-R. Titanium Progress Report. Corrosion. Mars G. Fontana. *Industrial and Engineering Chemistry,* v. 46, Jan. 1954, p. 103A-105A.
Developments needed for extensive use in chemical process industries. Table. (R general, Ti)

56-R. Corrosion Resistance of Galvanized-Steel-Stitched Aluminum Alloys. *Light Metal Age,* v. 11, Dec. 1953, p. 28.
National Bureau of Standards investigation of corrosion resistance of sheets of unclad and aluminum clad 24S-T3 aluminum alloy stapled together with galvanized steel wire. (R general, Al)

57-R. Boiler Plate Embrittlement. Sydney D. Scorer. *Mechanical World and Engineering Record,* v. 133, Dec. 1953, p. 558-559.
Caustic cracking. (R1)

58-R. Boiler Feed Water Treatment for Advanced Steaming Conditions. J. Leicester. *Overseas Engineer,* v. 27, Jan. 1954, p. 206-211.
Research into factors leading to boiler corrosion and deposits. Recommendations for feed water conditioning. Diagrams, graphs. 8 ref. (R1, R4)

59-R. Five Steps to Lower Corrosion Costs. V. B. Guthrie. *Petroleum Processing,* v. 9, Jan. 1954, p. 72-74.
Includes diagram. (R general)

60-R. Chemicals Commonly Used in Internal Boiler Water Treatment. Richard B. Conlan. *Plant,* v. 9, Jan. 1954, p. 50-53.
Chemicals for preventing scale, adjusting pH and removing dissolved oxygen completely to prevent pitting. Photographs, tables. (R4, R10)

61-R. Machine Tool Corrosion by Soluble Cutting Oils. I. *Product Finishing,* v. 6, Dec. 1953, p. 82-86.
Practical determination of extent of corrosion with a series of commercial soluble oils. Photographs, tables. 3 ref. (R7, G21, TS)

62-R. The Status of Fretting Corrosion. II. Mechanism Identification and Prevention of Fretting. W. E. Campbell. *Scientific Lubrication,* v. 5, Dec. 1953, p. 18-22.
Classification of wear corrosion phenomena and prevention. Photograph. 19 ref. (R1)

63-R. Corrosive Action of Dissolved Gases on Steel in Water. J. Wade Watkins and Jack Wright. Paper from "General Papers Presented Before the Division of Petroleum Chemistry". American Chemical Society, Div. of Petroleum Chemistry, p. 5-13.
Evaluates comparative efficiencies of different methods used to condition and inject water, from the standpoint of minimizing corrosion and preventing plugging of producing formation of water-input wells, and to investigate possibility of improving existing methods or of devising new ones. Diagram, graph, photograph. 8 ref. (R9, R4, ST)

64-R. The Mechanism of Oxidation of Metals and Alloys at High Temperatures. Karl Hauffe. Paper from "Progress in Metal Physics". v. IV. Interscience Publishers, Inc., p. 71-104.
New theoretical viewpoints on formation of scale on various metals. (R2)

65-R. The Current Status of Fretting Corrosion. W. E. Campbell. Paper from "Symposium on Fretting Corrosion". ASTM Special Technical Publication no. 144. American Society for Testing Materials, p. 3-19; disc., p. 19-23 + 1 plate.
Fretting wear of metal surfaces. Methods of mitigating fretting. Suggestions for future research on the mechanism. Graph, micrographs, table. 46 ref. (R1)

66-R. Fretting Corrosion Tendencies of Several Combinations of Materials. J. R. McDowell. Paper from "Symposium on Fretting Corrosion". ASTM Special Technical Publication no. 144. American Society for Testing Materials, p. 24-39; disc., p. 82.
Combinations of materials, both metallic and nonmetallic, were subjected to conditions producing fretting corrosion in a effort to evaluate their comparative susceptibility to this action. Table listing results in three groups of relative resistance. Tables, photographs, diagram. 9 ref. (R1)

67-R. Influence of Fretting Corrosion on the Fatigue Strength of Fitted Members. Oscar J. Horger. Paper from "Symposium on Fretting Corrosion". ASTM Special Technical Publication no. 144. American Society for Testing Materials, p. 40-51; disc., p. 52-53.

Fundamental nature of the fatigue problem associated with fretting. Eight factors separately treated as to how each influences fatigue strength regarding both the initiation and propagation of fatigue cracks. Photographs, graphs, tables. 24 ref. (R1, Q7)

68-R. Effect of Lubricants in Minimizing Fretting Corrosion. E. W. Herbek, Jr., and R. F. Strohecker. Paper from "Symposium on Fretting Corrosion". ASTM Special Technical Publication no. 144. American Society for Testing Materials, p. 54-66; disc., p. 67-70.

Survey of past work on the effect of lubricants in minimizing fretting corrosion. Investigators differ on corrective effect of specific lubricants. Tables, photograph. 20 ref. (R1)

69-R. Test Equipment for Evaluating Fretting Corrosion. H. H. Uhlig, W. D. Tierney and A. McClellan. Paper from "Symposium on Fretting Corrosion". ASTM Special Technical Publication no. 144. American Society for Testing Materials, p. 71-78; disc., p. 79-81.

Test machine designed and constructed to measure fretting corrosion quantitatively under precisely defined conditions. Photographs, graphs, diagram. 11 ref. (R1, R11)

70-R. Corrosion Behavior of Stainless Steels in Oxidizing Solutions. Corrosion in Chromic Acid Solutions. M. M. Kurtepov, G. V. Akimov and N. N. Bardizh. Henry Brutcher, Altadena, Cal., Translation no. 3054, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 87, no. 4, 1952, p. 625-626.)

Effect of steel composition, concentration of acid and temperature of solution. Tables. 1 ref. (R5, SS)

71-R. Study of Process of Oxidation (Rusting) of Iron by Isotope Method. E. I. Dontsova. Henry Brutcher, Altadena, Cal., Translation no. 3073, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 85, no. 1, 1952, p. 165-167.)

Distribution of oxygen isotopes between water and oxidation products. Results of computations and their verification by experiment. Tables. 7 ref. (R11, Fe)

72-R. (English.) **Stainless Steels of Austeno-Ferritic Structure.** *Aciers Fins & Spéciaux Francais,* 1953, no. 13, Mar., p. 65-69.

Corrosion resistance and mechanical properties. Photographs, tables. (R general, Q general, SS)

73-R. (French.) **General Survey of the Electrochemical Behavior of Metals. II.** Marcel Pourbaix. *Ossature metallique,* v. 18, no. 11, Nov. 1953, p. 581-590.

Polarization curves and behavior of iron in presence of aqueous solutions, in contact with a metal more noble than iron and in contact with a metal less noble than iron. Diagrams, tables, graphs. 17 ref. (R1, Fe, Pt, Zn, Cu)

74-R. (German.) **Atmospheric Rust Prevention. The Importance of Surface Pre-Treatment and Constructions Ready for Painting.** H. W. Dunker. *Chemie-Ingenieur-Technik,* v. 25, no. 11, Nov. 1953, p. 641-650.

Economical importance of pretreatment of iron surfaces. Tables, graphs, micrographs, diagrams, photographs. 24 ref. (R10, L26, Fe)

75-R. (German.) **Stray Current in Gas Lines in Berlin and Their Elimination.** Manfred Dewitz. *Gas und Wasserfach,* v. 94, Ausgabe Gas, no. 23, Dec. 1, 1953, p. 689-692.

Establishes existence of stray current. Corrosion effects on joints and welds. Precautions for electrochemical corrosion. Tables, photographs, graphs. (R1)

76-R. (German.) **Zinc for Roofs.** B. Trautmann. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 843-846.

Corrosion of zinc roofs depends largely on atmosphere. Discusses different designs. Photographs, diagram. (R3, T26, Zn)

77-R. (German.) **The Service Life of Sheet Zinc for Roofs.** H. Schneider. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 846-848.

Corrosion resistance of zinc roofs. Micrographs, photograph, tables. (R3, T26, Zn)

78-R. (German.) **Lead as a Corrosion Inhibitor in the Manufacture of Chemical Apparatus.** H. Hörger. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 878-880.

Intercrystalline and stress corrosion are factors which reduce wear resistance of lead. Photographs, diagram. (R10, Q9, Pb)

79-R. (German.) **An Experiment on the Oxide Growth on Metals.** B. Ilschner and H. Pfeiffer. *Naturwissenschaften,* v. 40, no. 23, 1953, p. 603-604.

Experimental results showed that an outward migration of cations was accompanied by a diffusion of oxygen. Micrographs. 12 ref. (R2, N1)

80-R. (Russian.) **Role of the Lead Dioxide Film During Corrosion of Lead Anode.** G. Z. Kir'iakov and I. A. Korchmarek. *Zhurnal Prikladnoi Khimii,* v. 26, no. 9, Sept. 1953, p. 921-924.

Effects of alloying additions on corrosion resistance of lead. Tables. 7 ref. (R2, Pb)

81-R. Electrolytic Etching of Stainless Steels. Results of Cooperative Testing Program for the Evaluation of the Oxalic Acid Etching Test. M. A. Streicher. **Electrolytic Etching in Oxalic Acid Used to Screen Cast CF-8 and CF-8M Stainless Steels From the 240-Hr. Nitric Acid Test.** F. H. Beck, N. D. Greene, Jr., and M. G. Fontana. **Screening Cast Stainless Steels by Electrolytic Etching in Oxalic Acid.** G. W. Jackson and W. A. Luce. *ASTM Bulletin,* 1954, no. 195, p. 63-74.

Includes tables, photomicrographs, photograph. 12 ref. (R11, SS)

82-R. $200 Million Down the Drain. *Bakelite Review,* v. 25, Jan. 1954, p. 16-18.

Application of pressure-sensitive vinyl tape to control corrosion on underground pipelines. Photographs. (R10, L26)

83-R. Chlorimet 2. Walter A. Luce. *Chemical Engineering,* v. 61, Feb. 1954, p. 246, 248, 250, 252.

Resistance of this material of construction to a number of corrosives, with physical properties and applications in chemical industry. Photograph, tables, diagrams. (R general, Q general, T29, Ni, Mo)

84-R. The Rate of Dissolution and the Passivation of Titanium in Acids With Ammonium Fluoride Added. M. E. Straumanis and C. B. Gill. *Electrochemical Society, Journal,* v. 101, Jan. 1954, p. 10-15.

Passivation of titanium by ammonium fluoride is caused by decrease in number of active local cathodes (covered by the salt film), and by the increase of overvoltage (polarization) on the free cathodes. Tables, graphs, 13 ref. (R10, Ti)

85-R. NBS Lab Corrosion Tests Yield 10-Year Field Data in Six Months. *Gas,* v. 30, Jan. 1954, p. 57-58.

Technique used should provide a valuable basis for predicting service of iron and steel structures exposed to various soils. Diagram. (R8, CI, ST)

86-R. Behaviour of Galvanized Steel in Sodium Benzoate Solution. P. T. Gilbert and S. E. Hadden. *Journal of Applied Chemistry,* v. 3, Dec. 1953, p. 545-546, 547-548.

Electrochemical measurements showed that in certain circumstances, steel became anodic to zinc. Reasons are discussed. Table. 5 ref. (R5, ST, Zn)

87-R. Hollow Drill Steels. W. W. Durand. *Mining Congress Journal,* v. 40, Jan. 1954, p. 44-46.

Some observations on scaling rate at various times and temperatures. Graphs, photographs. (R2, TS)

88-R. Laboratory Measurement of Corrosion in Soils. *National Bureau of Standards, Technical News Bulletin,* v. 38, Jan. 1954, p. 13-14.

Six-month test is shown to agree with ten-year field tests. Cell uses differential aeration of metal disks in contact with soil. (R8)

89-R. Corrosion Resistance of Galvanized-Steel-Stitched Aluminum Alloys. *National Bureau of Standards, Technical News Bulletin,* v. 38, Jan. 1954, p. 14-15.

Tests were made with sheets of aluminum clad and unclad aluminum alloy in marine atmospheres and in sea water. Photographs. (R3, R4, Al)

90-R. The Water Side Deterioration of Diesel Cylinders. F. L. La Que. *Power Engineering,* v. 58, Jan. 1954, p. 76-77.

Successful application of high chromate concentrations, material selection, vibration dampening, and air injection. Photographs. 3 ref. (R4)

91-R. Does Antifreeze Destroy Cars? *Railway Age,* v. 136, Jan. 18, 1954, p. 22-24, 26.

Tests of corrosion from calcium chloride applied to coal and ore to prevent lading freezing to car. Photographs, tables, graph, diagram. (R6, R7)

92-R. Rust Hasn't a Chance. Carl O. Durbin. *SAE Journal,* v. 62, Jan. 1954, p. 30-33.

Based on paper "Corrosion Protection During Processing, Storage, and Shipment—Automotive Application" presented at SAE Summer Meeting, Atlantic City, June 8, 1953. Photographs. (R3)

93-R. A Fundamental Investigation of Fretting Corrosion. H. H. Uhlig, I. Ming Feng, W. D. Tierney and A. McClellan. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3029, Dec. 1953, 52 p.

Summarizes all phases of an investigation of fretting corrosion which has been conducted over a period of several years. Photographs, tables, diagrams, graphs. 32 ref. (R1, CN)

94-R. (Russian.) **Effect of Heat Treatment on Intercrystalline Corrosion Resistance of Stainless Steel 1Kh18N9T Containing Various Ratios of Carbon and Titanium.** E. I. Astrov and V. N. Biriukova. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 61-65.

Tests show that quenching temperature for optimum properties de-

pends on grain size, carbon content, and carbon-titanium ratio. Micrographs, tables. 5 ref. (R2, J26, SS)

95-R. Corrosion Characteristics of Alloying Elements of Stainless Steels in Oxidizing Solutions. Corrosion of Chromium. M. M. Kurtepov and G. V. Akimov. Henry Brutcher, Altadena, Cal., Translation no. 3036, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 87, no. 5, 1952, p. 795-796.)

Previously abstracted from original. See item 351-R, 1953.
(R5, Cr, SS)

96-R. Development of Cathodic Protection in Belgium. A. Weiler. *Chemistry & Industry,* 1954, no. 3, Jan. 16, p. 56-63.

Translation of a paper read at a Symposium on Cathodic Protection, organized by the Corrosion Group of the Society, at the Institution of Electrical Engineers, Savoy Place, London, W.C.2., Nov. 13, 1953. Shows how a particular case of protection against stray currents started a train of research which led to development of means of protection against corrosion from all sources. Diagrams, graphs. (R10)

97-R. A Suggested Method of Evaluating the Porosity of Coatings on Ferrous Metals. T. W. Farrer. *Chemistry & Industry,* 1954, no. 3, Jan. 16, p. 77-78.

This objective is sought either by simulating corrosive conditions to which coating will be exposed in service, or by employing artificial means whereby porosity may be revealed. 3 ref. (R11, Sn, Zn, Fe)

98-R. Corrosion and Cathodic Protection. G. G. Portch and W. Godfrey Waite. *Coke and Gas,* v. 16, Jan. 1954, p. 19-23.

Causes of corrosion in buried gas mains and other structures. Means for eliminating this corrosion. Tables, diagrams, photographs.
(R8, R10, ST)

99-R. Experiences With Filming Amines in Control of Condensate Line Corrosion. H. L. Kahler and J. K. Brown. *Combustion,* v. 25, Jan. 1954, p. 55-58.

Experimental studies. Photographs, diagram, tables. 4 ref.
(R10, CN)

100-R. Corrosion Inhibition in Acid Solution. Cecil V. King and Edward Hillner. *Electrochemical Society, Journal,* v. 101, Feb. 1954, p. 79-83.

Measurements of effectiveness of three inhibitors on iron, zinc and cadmium specimens in nitrate solutions. Tables. 13 ref.
(R10, Fe, Zn, Cd)

101-R. Microstructure and the Corrodibility of Steel in Inhibited Hydrochloric Acid Solutions. P. H. Cardwell. *Electrochemical Society, Journal,* v. 101, Feb. 1954, p. 84-90.

Two acid inhibitors were examined to investigate materials which could be used satisfactorily to protect steels with various grain structures. Tables, graph, photomicrographs. 10 ref. (R10, R5, CN)

102-R. Why Hot Water Storage Tanks Corrode. T. S. Howald. *Gas Age,* v. 113, Jan. 28, 1954, p. 15-18, 46-48.

Part of symposium presented at Case Institute of Technology, Cleveland, Aug. 24-27, 1953. Galvanic corrosion may be minimized by proper material selection use of dielectric couplings and employing sacrificial anodes. Operating temperatures below 140° F. and use of larger tanks to avoid overheating add to life of equipment. Graphs, table. 28 ref.
(R4, R1, CN)

103-R. The Oxidation of Titanium at High Temperatures in an Atmosphere of Pure Oxygen. A. E. Jenkins. *Institute of Metals, Journal,* v. 82, Jan. 1954, p. 213-221 + 1 plate.

Investigation in temperature range 600-925° C. at an oxygen pressure of 700 mm. of mercury. Graphs, tables. 13 ref. (R2, Ti)

104-R. Corrosion of Nickel Cast Irons in Soils. Irving A. Denison and Melvin Romanoff. *Journal of Research, National Bureau of Standards,* v. 51, Dec. 1953, p. 313-320.

Results of measurements of corrosion and strength of nickel cast irons after exposure to different soil conditions for a maximum of 14 years. Photographs, tables. 4 ref.
(R8, Q23, CI)

105-R. How Does Wrought Iron Stand Up in Corrosive Marine Services? J. Lyell Wilson. *Marine Engineering,* v. 59, Feb. 1954, p. 63-66.

Lack of correlation between testing results and service records. Graphs, photographs, tables.
(R3, R4, Fe)

106-R. Don't Be Misled About "Corrosion Resistance". W. L. Nelson. *Oil and Gas Journal,* v. 52, Feb. 1, 1954, p. 98.

Data on common corrosion resistant alloys and steels. Table.
(R general, AY, SS, Fe, Zn, Ni, Cr, Mo, Cu)

107-R. Corrosion—Prevention and Control. B. C. Thiede. *Paint Industry Magazine,* v. 69, Jan. 1954, p. 31-33.

Use of noncorrosive equipment, paint and cleaning. Corrosion field tests. (R general, L general)

108-R. Cathodic Protection of Pipelines and Storage Tanks. A. G. Thomson. *Petroleum,* v. 17, Feb. 1954, p. 54-55, 64.

Review of current Russian practice and equipment. (R10)

109-R. Machine Tool Corrosion by Soluble Cutting Oils. II. *Product Finishing,* v. 7, Jan. 1954, p. 74-86.

Results of investigation of the corrosive action of 11 oils on cast iron similar to that used in machine tool construction. Tables, graphs. (R7, CI)

110-R. Inhibition of Corrosion of Nitrided Steel in Sulfuric Acid. S. A. Balezin and V. B. Ratinov. Henry Brutcher, Altadena, Cal., Translation no. 2984, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 85, no. 2, 1952, p. 367-368.)

Previously abstracted from original. See item 529-R, 1952. (R10, ST)

111-R. On the Mechanism of Corrosion Fatigue. G. V. Karpenko. Henry Brutcher, Altadena, Cal., Translation, no. 3159, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 77, no. 5, 1951, p. 827-830.)

Previously abstracted from the original. See item 294-R, 1951. (R1, ST)

112-R. (Russian.) **The Rusting of Steel Objects Due to Penetration of Water Vapor, Sulfur Dioxide, and Hydrogen Sulfide Through a Layer of Spindle Oil.** V. V. Skorchelletti and S. D. Vasil'ev. *Zhurnal Prikladnoi Khimii,* v. 26, no. 10, Oct. 1953, p. 1033-1038.

Results demonstrate possibility of rusting under an oil layer. Tables, graphs, drawings. 3 ref. (R7)

113-R. (Book.) **Corrosion Testing Procedures.** F. A. Champion. 355 p. 1952. Chapman & Hall, London. 36 s.

British edition of book published by John Wiley & Sons. See item 482-R, 1952. (R11)

114-R. Corrosion by Water at Low Flow Velocity. T. E. Larson and R. M. King. *American Water Works Association, Journal,* v. 46, Jan. 1954, p. 1-9.

Need for fresh-water corrosion research. Experiments demonstrating the behavior of solutions at corrosion cell electrodes. Possible explanation for the inhibitory effect of bicarbonate and carbonate alkalinity. Graphs, photographs, table. 9 ref. (R4, CN)

115-R. Experimental Set-Up for Investigating Ash Deposition and Corrosion Phenomena on Gas-Turbine Materials at High Temperatures. C. Kind. *Brown Boveri Review,* v. 40, nos. 5-6, May-June 1953, p. 196-199.

Effect of fuel ash deposits on machine construction materials. Photographs, graphs. (R7, SS)

116-R. Cathodic Production. Economic Aspects of Corrosion Control. D. H. Lewis and O. C. Mudd. *Chemistry & Industry,* 1954, no. 4, Jan. 23, p. 93-100. (Paper read at a Symposium on Cathodic Protection, Corrosion Group of the Society of Chemical Industry at Institute of Electrical Engineers, London, Nov. 13, 1953.)

Stresses economic aspects of corrosion control and role of cathodic methods in a properly balanced program for protection of pipe lines and similar underground structures. Graphs, tables. (R10, CN)

117-R. Paint vs Corrosion—Some Aspects of the Problem in the Gulf Coast Area. V. B. Volkening. *Corrosion,* v. 10, Feb. 1954, p. 63-69.

Theory of metallic corrosion. Methods of testing and examples of coating successes and failures. Photographs, tables. 7 ref. (R1, R11, L26)

118-R. The Measurement of Electrode Potentials. Norman Hackerman. *Corrosion,* v. 10, Feb. 1954, p. 70-72.

Few half cells of interest in corrosion measurements described in terms of preparation and use. Brief descriptions of potential measuring devices and their principles of operation. (R11)

119-R. Field and Laboratory Method for Investigating Corrosion. J. B. Armstrong. *Gas,* v. 30, Feb. 1954, p. 99, 101-102, 104.

Adapted from a paper presented at the annual meeting of the California Natural Gasoline Association, Los Angeles, Oct. 1953. Corrosivity evaluation and means of visual and instrument inspections. Photographs, diagrams. 4 ref. (R11)

120-R. Sensitive Corrosion Measurements With an Interferometer. *Glass Industry,* v. 35, Feb. 1954, p. 82, 106.

New techniques adaptable to optical glass, porcelain enamel, quartz and other natural and artificial silicates and various metals. Photographs. (R11)

121-R. Final Report on the Field Exposure Test Conducted by the IP Protectives Panel. *Institute of Petroleum, Journal,* v. 40, Jan. 1954, p. 32-36.

Conduct of test; results obtained. Tables. (R11, R3)

122-R. Combating Corrosion, A Special Symposium. *Oil and Gas Journal,* v. 52, Feb. 15, 1954, p. 122-130, 132, 134-136, 141-143, 145-150, 152-156, 159-160, 162-164.

Includes "Corrosive Oil and Gas Areas in the United States", D. A. Shock; "How to Get More Value From Paint", William T. Thies; "Protecting the Pipe-Line Protection", Frank B. Burns; "Management's Stake in Corrosion Mitigation", Lewis Finch, Jr.; "New Light on Asphalt Pipe-Line Coatings", H. C. McAninch; "How to Sell Management on Corrosion Mitigation", Ted L. Canfield; "Cold-Applied Coal-Tar Coatings", W. F. Fair, Jr.; "Organic Inhibitors in Oil and Gas Wells", P. D. Muir; "Semipolar Organic Inhibitors Check Corrosion", Charles M. Blair; "Microbiological Corrosion", J. Bennett Clark; "Cathodic Protection for Pipe Lines", B. J. Whitley, Jr.; "Fundamental Electrochemistry of Corrosion", Bernard O. Heston; "Good Design Now Will Stop Corrosion Later", F. A. Prange; "Hot Coal-Tar Coatings Approach Ideal", N. T. Shideler. Maps, diagrams, tables, photographs, graphs. 16 ref. (R general)

123-R. New Techniques—Current Problems in Controlling Corrosion. II. O. C. Mudd. *Pipe Line News,* v. 26, Feb. 1954, p. 34-39.

Effectiveness of corrosion control measures can be improved by modifications giving better results from materials and energy presently used in mitigation measures. Includes construction features conserving protective current, adapting or designing accessory equipment to withstand destructure forces and choice of protective coating materials having good potential service life at a reasonable cost. Photographs, graphs, table. (R10)

124-R. Corrosion Insurance for Oil Storage Tanks. B. D. Allison. *Railway Track and Structures,* v. 50, Feb. 1954, p. 54-56.

Cathodic protection of storage facilities for diesel fuel. Photograph, diagrams. (R10, CN)

125-R. The Corrosion of Copper Tube Used in Soil-Stack Installations. H. E. Babbitt, E. R. Baumann and H. N. Hayward. *University of Illinois Bulletin, (Engineering Experiment Station Bulletin Series no. 419,)* v. 51, no. 17, Oct. 1953, 42 p.

Corrosion evaluation of 14 copper specimens made by visual observation, weight loss, increase of electrical resistance and depth of pitting. Tables, photographs, diagrams, graphs. (R11, Cu)

126-R. The Magnetic Oxygen Analyzer in Studies of Oxygen Uptake. Sam R. Hoover, Lenore Jasewicz and Mandor Porges. *Water & Sewage Works,* v. 101, Feb. 1954, p. 81-83.

New instrument for measuring aerobic oxidation rates. Graphs, photographs, table. (R2)

127-R. Chemical Behaviour as Influenced by Surface Condition. U. R. Evans. Paper from "Properties of Metallic Surfaces, Symposium". Institute of Metals, Monograph and Report Series 13. Institute of Metals, p. 253-280; disc., p. 295-364.

Effect of surface condition on corrosion probability, distribution and velocity. Micrographs. 61 ref. (R1)

128-R. (French.) **Concerning Steels Resistant to Temperature Exceeding 450° C. II.** Georges Vidal. *Chaleur & Industrie,* v. 34, no. 341, Dec. 1953, p. 350-356.

Corrosion resistance and strength of various steels. Graphs, photograph. 6 ref. (R11, Q23, SS)

129-R. (German.) **The Oxidation Process in Titanium Carbide-Cobalt Hard Metals.** Willy Kinna and Otto Rüdiger. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 535-542.

X-ray, electron-ray, metallographic and ultramicroscopic investigations indicated parabolic law of oxidation in 600-1000° C. range. Tables, graphs, micrographs. (R2, Ti, Co)

130-R. (German.) **Protection of Water Mains Against Corrosion. Report of the Second International Congress on Water Supply in Paris 1952.** H. Steinrath. *Gas und Wasserfach,* v. 95, Ausgabe Wasser, no. 2, Jan. 15, 1954, p. 46-47.

Susceptibility of cast iron, steel and various types of concrete to soil corrosion. Efficiency of various protective coatings.
(R8, L general, CI, ST)

131-R. (German.) **Corrosion Tests on Aluminum.** *Metall,* v. 8, nos. 1-2, Jan. 1954, p. 31.

Effect of impurities on susceptibility of aluminum and aluminum alloys to corrosion. Table. 6 ref.
(R11, Al)

132-R. (German.) **Local Tendencies of Solution Pressure of Metals to Change Under Slight Stresses.** Paul Koch. *Metalloberfläche,* Ausgabe A, v. 8, no. 1, Jan. 1954, p. 1-7.

Investigations of effect of stresses on corrosiveness of metals. Table, diagrams, graphs. (To be continued.) (R1, Fe, ST, Ag, Cu, Pt)

133-R. (German.) **Slagging of Gas Turbine Plants From Ashes of Fuels and Resulting Corrosion of Materials.**

J. Biert and R. Scheidegger. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 19, no. 12, Dec. 1953, p. 359-366.

Gas-flow disturbance, reduced ef-

ficiency and corrosion of heat resistant steel. Table, graph, diagram, photographs. 6 ref. (R7, SS)

134-R. (German.) **Anodic Behavior of Nickel in Hydrochloric Acid, Sodium Chloride, and Nickel Chloride Solutions.** Willi Machu and Adly Ragheb. *Werkstoffe und Korrosion,* v. 4, no. 12, Dec. 1953, p. 429-436.

Experiments showing action of nickel in acid and salt solutions. Tables, graphs. 12 ref. (R6, Ni)

135-R. (German.) **Corrosion Problem.** Bruno Waeser. *Werkstoffe und Korrosion,* v. 4, no. 12, Dec. 1953, p. 437-442.

Corrosion, prevention and resistance tests. 86 ref.
(R general, Cu, Ni, AY, Al, Mo, Zr)

136-R. (German.) **The Mechanism of Oxidation and Corrosion Processes in Metals and Alloys.** Karl Hauffe. *Zeitschrift für Metallkunde,* v. 44, no. 12, Dec. 1953, p. 576-583.

Shows that Wagner and Schattky's disorder theory can be used to explain corrosion mechanism. Discusses disorder phenomena in various oxides and high-temperature oxidation of various alloys. Graphs, diagrams. 37 ref.
(R2, N10, Ti, Ni, Fe, Ag, Cd, Br)

137-R. The Mitigation of Marine Fouling by Anaerobic Treatment. H. T. Duplice and R. C. Alexander. *ASME, Transactions,* v. 76, Feb. 1954, p. 241-243.

Deals with killing of marine fouling organisms, particularly the bay mussel, in salt cooling water conduits by anaerobic treatment. Graphs, photographs. 7 ref. (R1)

138-R. Reduction of Condensate-Line Corrosion. Scott Jensen and E. R. Lang. *ASME, Transactions,* v. 76, Feb. 1954, p. 245-249; disc., p. 249.

Progress in reducing iron and copper corrosion using ammonia, cyclohexylamine, morpholine and sodium sulphite. Diagrams, graphs, tables. (R10, Fe, Cu)

139-R. The Rate of Dissolution of Copper. Benjamin C. Y. Lu and M. F. Graydon. *Canadian Journal of Chemistry,* v. 32, Feb. 1954, p. 153-163 + 1 plate.

Rate of dissolution of polycrystalline metallic copper in sulphuric acid solutions determined as a function of temperature, oxygen pressure, rotation speed, hydrogen ion concentration, sample area and corroding solution volume. Graphs, micrographs, tables. 7 ref. (R11, Cu)

140-R. Cathodic Protection and Control of Corrosion in the Middle East. W. C. R. Whalley. *Chemistry & Industry,* 1954, no. 6, Feb. 6, p. 140-147.

Corrosion problems in buried oil pipes. Photographs, diagram, graphs, map. 1 ref. (R10)

141-R. Corrosion of Steel-Cored Aluminium Conductors. J. S. Forrest and J. M. Ward. *Engineering,* v. 177, Feb. 5, 1954, p. 183.

Methods of measuring corrosion. (R11, Al)

142-R. Vanadium. S. H. Frederick and T. F. Eden. *Iron & Steel,* v. 27, Feb. 1954, p. 67-69.

Corrosion aspects in gas turbines. Tables. (R general, V)

143-R. Stress-Corrosion of Aluminium-Magnesium Alloys. I. The Effect of Tensile Stress on the Corrosion of Aluminium-7%-Magnesium and Aluminium-5%-Magnesium Alloys. II. Methods for Expressing Stress-Corrosion Susceptibility on a Comparative Basis. E. Lloyd Jones. *Journal of Applied Chemistry,* v. 4, Jan. 1954, p. 1-10.

Wires were tested by immersion in 3% sodium chloride solution. Threshold stress values were determined. Local areas appeared more susceptible to attack. Tables, diagrams, graphs. 9 ref. (R1, Al, Mg)

144-R. Corrosion of Iron in the Presence of Dispersed and Solid Sulphur. Raymond B. Seymour, Walter R. Pascoe and Robert H. Steiner. *Journal of Applied Chemistry,* v. 4, Jan. 1954, p. 11-13.

Investigation undertaken to supply additional information and substantiate previous observations, and standard water works practice. Tables. 4 ref. (R6, CI)

145-R. Treatment of Cooling Waters. L. W. Fitzpatrick. *Power Engineering,* v. 58, Feb. 1954, p. 82-84.

Organic and inorganic corrosion and deposits in cooling towers. Photograph, tables. (R5)

146-R. Application of Aluminium in the Bleaching-Powder Industry. Y. C. Cheng and T. H. Taeng. *Sheet Metal Industries,* v. 31, no. 322, Feb. 1954, p. 143-150.

Tests show that bleach does attack aluminum but less than other materials. Tables, graphs, photographs. (R5, T29, Al)

147-R. (French.) **Application of the Kinetics of Reaction to the Study of Corrosion.** T. G. Owe Berg. *Journal de chimie physique,* v. 50, nos. 11-12, Nov.-Dec. 1953, p. 617-623.

Rates of dissolution of various metals in acid solutions were measured. Various aspects of process of dissolution. Graphs. 20 ref.
(R2, P13)

148-R. (Russian.) **Influence of the Dimension of Test Specimens on the "Adsorption" and Corrosion Fatigue of Steel.** G. V. Karpenko and A. V. Karlashov. *Doklady Akademii Nauk SSSR,* v. 92, no. 3, Sept. 21, 1953, p. 603-605.

Investigations on structural steel in water, air and oil. Method of testing. Results. Table, graphs. 3 ref. (R1, AY)

149-R. Corrosion for Chemical Engineers. I. Electrochemical Principles of Corrosion. L. L. Shreir. *Chemical & Process Engineering,* v. 35, Feb. 1954, p. 41-45.

Electrochemical considerations as theoretical background for subsequent articles. Diagrams, tables, graphs. 30 ref. (R1)

150-R. Chlorimet 3. Walter A. Luce. *Chemical Engineering,* v. 61, Mar. 1954, p. 254, 256, 258, 260.

Resistance of this important material of construction to a number of corrosives, with mechanical properties and applications in the chemical industry. Charts.
(R general, Q general, T29, Ni, Cr, Mo)

151-R. Evaluation of Several Sets of Constants and Several Sources of Variability. V. W. Vaurio and Cuthbert Daniel. *Chemical Engineering Progress,* v. 50, Feb. 1954, p. 81-86.

Test designed to establish sources of variation in prune-pack results described for tin-plate corrosion-resistance investigations. Tables, diagrams. 8 ref. (R11, CN, Sn)

152-R. Cathodic Protection as Applied to Royal Canadian Naval Vessels in Active Service. K. N. Barnard. *Chemistry & Industry,* 1954, no. 7, Feb. 13, p. 172-182.

Techniques of application, results obtained and advantages and disadvantages of systems employing magnesium, steel, graphite or platinum anodes. Diagrams, graphs, table. (R10, Mg, ST, Pt)

153-R. Cathodic Protection of Storage Tanks. B. D. Allison. *Diesel Power,* v. 32, Feb. 1954, p. 30-32.

Installation to protect diesel fuel oil and water storage tanks. Diagrams, table. (R10)

154-R. Vapor Phase Corrosion Inhibitors. I. D. G. Berwick and B. H. Levelton. *Engineering Journal,* v. 37, Feb. 1954, p. 128-131.

Vapor phase inhibitors must be stable, water-soluble and sufficiently volatile to maintain an adequate inhibiting concentration in atmosphere around metal to be protected. Photographs. 15 ref. (R10)

155-R. Thermodynamics of Irreversible Processes Applied to Corrosion. P. A. Johnson and A. L. Babb. *Industrial and Engineering Chemistry,* v. 46, Mar. 1954, p. 518-523.

Application of polarization data to determination of corrosion currents studied as a part of a survey of possible methods for measuring instantaneous corrosion rates of metals in solution. Diagrams, graph, table. 11 ref. (R11)

156-R. Action of Polar Organic Inhibitors. Norman Hackerman and A. C. Makrides. *Industrial and Engineering Chemistry,* v. 46, Mar. 1954, p. 523-527.

Theories of cathodic inhibition of corrosion, adsorption of polar organic inhibitors and applications of mechanism. 45 ref. (R10)

157-R. Corrosion Protection. *Metal Treatment and Drop Forging,* v. 21, Feb. 1954, p. 65.

Latest developments in industry. (R general)

158-R. Study and Recommendations and Methods of Treating Water for Diesel Locomotive Cooling and Steam Generator Feedwater System. H. M. Schudlich, chairman. Paper from "Official Proceedings of the 1953 Annual Meeting Master Boiler Makers' Association", p. 38-44; disc., p. 44-47.
(R4)

159-R. Corrosion Characteristics of Stainless Steels in Oxidizing Solutions (Corrosion in Nitric Acid Solutions). M. M. Kurtepov and G. V. Akimov. *Henry Brutcher, Altadena, Calif., Translation no.* 3078, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 87, no. 1, 1952, p. 93-95.)

Experimental study of effects on corrosion rate of stainless steel by potassium dichromate, potassium permanganate, and ammonium vandate additions to nitric acid solutions. Tables, graph. (R6, SS)

160-R. Influence of Furnace Atmosphere on the Surface of Tube Rounds and Tubes. W. Scheurer. *Henry Brutcher, Altadena, Calif., Translation no.* 3086, 21 p. (From *Stahl und Eisen,* v. 72, no. 16, 1952, p. 935-941.)

Previously abstracted from original. See item 452-R, 1952.
(R2, J2, ST)

161-R. Testing of Metallic and Nonmetallic Protective Coatings for Corrosion Resistance in an Artificial Industrial Atmosphere. W. Kesternich. *Henry Brutcher, Altadena, Calif., Translation no.* 3086, 21 p. (From *Stahl und Eisen,* v. 71, no. 11, 1951, p. 587-588.)

Simple and rapid condensation test for effectiveness of metallic and nonmetallic protective coatings when exposed to various atmospheres. Photographs, graphs, diagram. 1 ref. (R3)

162-R. Contribution to the Problem of Corrosion Fatigue. G. V. Karpenko. *Henry Brutcher, Altadena, Calif., Translation no.* 3160, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 79, no. 2, 1951, p. 287-288.)

Previously abstracted from original. See item 85-R, 1952. (R1, ST)

163-R. (French.) **Comparison of the Oxidation Mechanism of Iron-Chromium, Nickel-Chromium, and Nickel-Aluminum Binary Alloys.** Jean Moreau and Jacques Bénard. *Comptes rendus,* v. 237, no. 22, Nov. 30, 1953, p. 1417-1419.

Examination of specimens accomplished by X-ray diffraction and micrography of polished sections. Diagram. 4 ref.
(R2, M22, Fe, Cr, Ni, Al)

164-R. (German.) **The Passivity of Thallium in Perchloric Acid, Sodium Chloride, and Sodium Sulfate Solutions.** Willi Machu and Ezzat M. Khairy. *Werkstoffe und Korrosion,* v. 5, no. 1, Jan. 1954, p. 11-17.

Experiments prove two different phases occur in passivity. Diagram, graphs, tables. 9 ref. (R10, Tl)

165-R. (Italian.) **Theoretical and Experimental Study of Some Phenomena of Dezincification in Brasses. I. Types of Corrosion in Brasses—Dezincification. Causes and Theories.** Paolo Lombardi. *Metallurgia italiana,* v. 45, no. 12, Dec. 1953, p. 449-456.

Investigates various types of corrosion in copper-zinc alloys. Table. (To be continued.) (R2, Zn, Cu)

166-R. (Italian.) **High Temperature Oxidation of Cu-Al Alloys.** Paolo Spinedi. *Metallurgia italiana,* v. 45, no. 12, Dec. 1953, p. 457-461.

Experiments with various copper-aluminum alloys. Variations in weight as function of temperature were measured. Graphs. 15 ref.
(R2, Cu, Al)

167-R. Stability of Refractories in Liquid Metals. E. L. Reed. *American Ceramic Society, Journal,* v. 37, Mar. 1954, p. 146-153.

Corrosion of molybdenum, tungsten, tantalum, rhenium and ceramic materials by liquid sodium, bismuth and tin. Photographs, diagrams, micrograph, tables, graph. 6 ref. (R6, Na, Bi, Sn, Mo, W)

168-R. Control of Internal Corrosion of Tankers. William B. Jupp and Carl J. Lamb. *American Society of Naval Engineers, Journal,* v. 66, Feb. 1954, p. 152-165.

Effects of corrosion on ship life. Mechanical and electrochemical approaches in solving problem. Tables. 9 ref. (R general)

169-R. Cathodic Protection. Its Application to Ships and Establishments of the Royal Navy. J. T. Crennell. *Chemistry & Industry,* 1954, no. 8, Feb. 20, p. 204-209.

Read at Symposium conducted by corrosion group of Society of Chemical Industry, London, Nov. 1953. Current measurement and use of magnesium and zinc anodes and effects of cathodic protection on paint and antifouling. Reviews protection of aluminum and stainless steel. Diagrams, photographs. 6 ref.
(R10, Al, CN, SS)

170-R. Effect of Operating Conditions on Corrosion of Hot Water Piping in Buildings. Henry L. Shuldener. *Corrosion,* v. 10, Mar. 1954, p. 85-90.

Design and fabrication of distribution system, corrosiveness and scale-forming characteristics of water and nature of piping materials. Diagrams. 11 ref. (R4)

171-R. Measured Potentials as Related to Corrosion and Polarization in Local Cells. Thomas P. May and F. L. LaQue. *Corrosion,* v. 10, Mar. 1954, p. 91-94.

Irreversible electrode potentials of corroding metals, with particular reference to corrosion rates. Tables, graphs. 4 ref. (R1)

172-R. Sea Water Immersion Trials of Protective Coatings. J. H. Greenblatt. *Corrosion,* v. 10, Mar. 1954, p. 95-99.

Panel tests show that vinyl finishes can be used on cathodically protected hulls. Shipboard trials show that a controlled cathodic protection system is required. Table, graphs, photographs. 18 ref. (R10)

173-R. Some Notes on Hydrogen Blistering. *Corrosion,* v. 10, Mar. 1954, p. 101-102.

Data obtained on diffusion of atomic hydrogen through several kinds of steel in acidic solutions. In an electric furnace grade steel, diffusion did not take place unless sulfide was present. Tables, graph, photograph. 2 ref. (R2, R5, ST)

174-R. Laboratory Methods for Evaluation of Inhibitors for Use in Oil and Gas Wells. E. C. Greco and J. C. Spalding, Jr. *Corrosion,* v. 10, Mar. 1954, p. 103-109.

Based on paper presented at Ninth Annual Conference and Exhibition

of the National Association of Corrosion Engineers at Chicago, Mar. 1953. Methods used by ten major producing companies, four chemical manufacturing companies and a university were gathered. General classification of tests used in laboratory along with information as to correlation of such tests with field experience. Tables, graph. 2 ref. (R10)

175-R. Radioactive Tracers in the Study of Pitting Corrosion on Aluminum. P. M. Aziz. *Electrochemical Society, Journal,* v. 101, Mar. 1954, p. 120-123.

Radioactive cobalt and lead ions in solution were used to study distribution of local cathodes on aluminum alloy specimens which were actively pitting. Processes of film breakdown and repair on aluminum alloy specimens, after introducing them into a corrosive environment, were studied. Micrograph, radiographs. 10 ref. (R2, Al)

176-R. The Kinetics of Oxidation of High Purity Nickel. E. A. Gulbransen and K. F. Andrew. *Electrochemical Society, Journal,* v. 101, Mar. 1954, p. 128-140.

Effect of time, temperature and surface pretreatment studied in temperature range 400 to 750° C., using a vacuum microbalance technique. Tables, graphs. 31 ref. (R2, Ni)

177-R. Badly Corroded Holder Lift Plates Speedily Restored by In-Service Repairs. M. C. McCallum. *Gas,* v. 30, Mar. 1954, p. 40-42.

Method for repair of deteriorated steel plates. Protection from galvanic corrosion. Photographs. (R1)

178-R. Testing the Tendency to Stress-Corrosion Cracking. (Digest of "Improving the Testing Method for Determining the Susceptibility of Steel to Stress-Corrosion Cracking", by Wilhelm Rädeker. *Stahl und Eisen,* v. 73, Apr. 9, 1953, p. 485-492.) *Metal Progress,* v. 65, Mar. 1954, p. 140, 142, 144.

Previously abstracted from original. See item 303-R, 1953. (R1, ST)

179-R. Effect of the Frequency of Stress Cycles Upon the Fatigue of Steel in Surface-Active and in Corrosive Media. G. Karpenko. *Henry Brutcher, Altadena, Calif., Translation no.* 3202, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 87, no. 5, 1952, p. 797-800.)

Previously abstracted from original. See item 780-Q, 1953. (Q7, R1, ST)

180-R. (Hungarian.) **Examination of the Cracks of the Tubes of "Vogelbusch" Evaporating Boilers Used in Alumina Plants.** Istvan Kurovszky. *Kohaszati Lapok,* v. 9, no. 1, Jan. 1954, p. 27-34.

Investigates tubes in two Hungarian factories. Causes of intercrystalline corrosion and elimination of defects. Diagrams, tables, micrographs, photographs. (R2)

181-R. (Russian.) **The Influence of pH on Process of Metal Corrosion.** L. I. Antropov. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 11, Nov. 1953, p. 1631-1635.

Tests on iron, nickel, zinc and magnesium showed that corrosion velocity and potential was dependent on pH of the solution. Table. 19 ref. (R1, Fe, Ni, Zn, Mg)

182-R. The Corrosion-Metallurgical Aspects of Sucker Rods and Their Oil Well Service Performance. F. J. Radd and R. L. McGlasson. *Journal of Petroleum Technology,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 199, Mar. 1954, p. 37-44.

Mechanisms of corrosion and corrosion fatigue damages to sucker rods examined from a fundamental electrochemical viewpoint. Relationships of sucker rod microstructures to these damaging effects defined. Diagrams, photographs, micrographs. 15 ref. (R1)

183-R. Cathodic Protection Eliminates Condenser Failures. *Chemical Processing,* v. 17, Apr. 1954, p. 40-42.

No visible corrosion found after five years on units protected by magnesium anodes. Photographs. (R10, CI, Mg)

184-R. The Resistance to Failure of Condenser and Heat Exchanger Tubes in Marine Service. P. T. Gilbert. *Institute of Marine Engineers, Transactions,* v. 66, Jan. 1954, p. 1-6; disc., p. 6-20.

Types of corrosion causing failures. Development of alloys resistant to these types of attack. Table, photographs, micrograph. 25 ref. (R3, Cu, Ni, Al)

185-R. Cathodic Protection for Steel Mill Grounding Systems. J. F. Headlee. *Iron and Steel Engineer,* v. 31, Mar. 1954, p. 113-115; disc., p. 115.

Advances in grounding practices in past years. Diagram, table. (R10)

186-R. Treatment of Water for the Iron and Steel Industry. A. J. Lamb and A. H. Waddington. *Iron and Steel Institute, Journal,* v. 176, Mar. 1954, p. 291-302.

Types of water usually available, treatment necessary to make them

suitable for particular purposes, design of plant used to effect treatment, chemical reagents more commonly used and plant control. Photographs, diagrams. (R4)

187-R. Control Your Corrosion Costs. L. R. Honnaker. *Steel,* v. 134, Mar. 22, 1954, p. 110-111.

Materials available to cut industry's multi-billion dollar corrosion bill. Fast identification of the trouble and correct inhibitor application guarantee impressive savings. Photograph. (R10)

188-R. Zinc-Rich Compounds Give Cathodic Protection. H. L. Grebinar. *Steel,* v. 134, Mar. 29, 1954, p. 113-114.

Coating can be brushed, sprayed or dipped. Using vinyl resins as binders, they contain 96% zinc by weight when dry. Photographs, table. (R10, Zn, ST)

189-R. Corrosion Resistance of Copper, Nickel, and Chromium-Plated Zinc, Aluminum, and Magnesium-Base Die Castings. M. R. Caldwell, L. B. Sperry, L. M. Morse and H. K. DeLong. Paper from "E.ectrodeposition Research". National Bureau of Standards Circular 529, p. 69-71; disc., p. 71-72. 1953. (Condensed from paper in *Plating,* v. 39, 1952, p. 142.)

Previously abstracted from original. See item 100-R, 1952. (R3, L17, Ni, Zn, Al, Mg, Cr)

190-R. (German.) **Intercrystalline Corrosion of Zinc-Aluminum-Copper Alloys.** E. Pelzel. *Metall,* v. 8, nos. 5-6, Mar. 1954, p. 169-173.

Study to determine structural connections between high and low aluminum content and influence of copper. Graphs, photographs, tables, diagram, micrographs. 6 ref. (R2, Zn, Al, Cu)

191-R. (German.) **Corrosion by Benzine and Chlorinated Hydrocarbons.** W. Katz and J. Sonntag. *Metall,* v. 8, nos. 5-6, Mar. 1954, p. 203-205.

Stability determined for pure aluminum, aluminum-magnesium alloys, duraluminum, die-cast aluminum, zinc, lead and chromium-nickel steel. Tables, photographs, micrographs. 4 ref. (R6, Al, Mg, Zn, Pb, AY, Cr, Ni)

192-R. (German.) **Scaling of Metals by Sulfur and Sulfur-Containing Gases.** O. Kubaschewski and O. von Goldbeck. *Metalloberfläche,* Edition A, v. 8, no. 3, Mar. 1954, p. 33-36.

Influence of moisture and temperature varies with corroding compounds and with the metals. Tables. 40 ref. (R2, R9)

193-R. (German.) **Corrosion of Iron Resulting From Temperature Differences of Electrolytes.** Walter Breckheimer and Jean D'Ans. *Werkstoffe und Korrosion,* v. 5, no. 2, Feb. 1954, p. 43-48.

Iron electrodes immersed in neutral potassium chloride solution at varying temperatures will form a corrosion element. Diagrams, graphs. (R2, Fe)

194-R. (Polish.) **Investigation of Electrochemical Corrosion in Liquids of Low Dielectric Constants.** St. Minc and L. Stolarczyk. *Przemysl Chemiczny,* v. 10(33), no. 2, Feb. 1954, p. 69-72.

Behavior of steel, copper, brass and aluminum in various solutions. Diagrams, graphs, micrographs. 6 ref. (R5, ST, Cu, Al, Zn)

195-R. (Polish.) **Corrosion Inhibitors of Steel in Sulfuric and Hydrochloric Acid.** H. Jodko. *Przemysl Chemiczny,* v. 10(33), no. 2, Feb. 1954, p. 75-80.

Investigates thiourea, dibenzene sulfoxide, "Tardiol F" and urotropine. Tables. 2 ref. (R10, ST)

196-R. Corrosion for Chemical Engineers. I. Corrosion and Design. L. L. Shreir. *Chemical & Process Engineering,* v. 35; *Corrosion Technology,* v. 1, Mar. 1954, p. 6-9.

Applies theoretical principles of corrosion to practical problems. Effect of metal, method of construction, shape, velocity of flow of the liquid and dissimilar metals in contact on the possibility of corrosion occurring. Graph, photographs, diagrams, table. 20 ref. (R general)

197-R. The Mechanism of Inhibition of the Corrosion of Iron by Sodium Hydroxide Solution. II. J. E. O. Mayne and J. W. Menter. *Chemical Society, Journal,* 1954, Jan., p. 99-103.

Film formed on iron by anodic discharge of hydroxyl ions is composed of material having cubic structure of either Fe_3O_4 or gamma-Fe_2O_3. Consequently it is indistinguishable from air-formed film. Graph. (R10, Fe)

198-R. The Mechanism of Inhibition of the Corrosion of Iron by Solutions of Sodium Phosphate, Borate, and Carbonate. J. E. O. Mayne and J. W. Menter. *Chemical Society, Journal,* 1954, Jan., p. 103-107 + 3 plates.

Film formed on iron by 0.1 normal solutions of disodium hydrogen phosphate, trisodium phosphate, sodium borate and sodium carbonate, in presence of air but in absence of air-formed film, removed by alcoholic iodine method. Composition determined by electron dif-

fraction. Tables, micrographs, X-ray diffraction patterns.
(R10, M22, Fe)

199-R. Aluminum Ground Connection Developed for Water Pipe. Robert Hickson. *Electrical World,* v. 141, Apr. 5, 1954, p. 128.

Bimetal contact with copper piping and corrosion are eliminated. Graph. (R10, Al, Cu)

200-R. Rate of Oxidation of Three Nickel-Chromium Heater Alloys Between 500° and 900° C. Earl A. Gulbransen and Kenneth F. Andrew. *Electrochemical Society, Journal,* v. 101, Apr. 1954, p. 163-170.

Studies of oxidation rate of three alloys as function of time and temperature. Data related to parabolic rate law and classical theory of diffusion. Tables, graphs. 20 ref.
(R2, Ni, Cr)

201-R. Slag Deposition and Corrosion in Gas-Turbine Plants. J. Biert and R. Scheidegger. *Engineers' Digest,* v. 15, Mar. 1954, p. 97-100. (From *Schweizer Archiv,* v. 19, no. 12, Dec. 1953, p. 359-366.)

Previously abstracted from original. See item 133-R, 1954. (R7, SS)

202-R. A Study of Boehmite Formation on Aluminium Surfaces by Electron Diffraction. R. K. Hart. *Faraday Society, Transactions,* v. 50, Mar. 1954, p. 269-273 + 1 plate.

Action of boiling distilled water on aluminum, including mechanically polished, electropolished and anodized specimens investigated. Graph. 15 ref. (R4, M22, Al)

203-R. New Techniques and Current Problems in Controlling Underground Corrosion. O. C. Mudd. *American Petroleum Institute, Proceedings,* sec. V. Transportation, v. 33, 1953, p. 35-45.

Includes adaptation of anodic metals for electrical-equipment grounding, isolation of reinforcing steel in concrete and measures which prevent current flow to metal contacts supported by concrete. Diagrams, photographs, graphs, table. (R8)

204-R. Causes of Corrosion in Deep Well Water Pumps in Israel. A Technical Note. D. Spector. *Corrosion,* v. 10, Apr. 1954, p. 122-123.

Galvanic currents caused by temperature differential between upper and lower portions of well liners and pump components; galvanic corrosion from incompatible metals; and current discharge from interconnected piping system. Diagrams, photographs. (R1, R4)

205-R. Economics of Cathodic Protection. Ray M. Wainwright. *Gas,* v. 30, Apr. 1954, p. 48-53.

Basic aspects of correct economic analysis. Includes elementary principles of interest rates, annuities, sinking funds and other types of transactions involving money. Methods of determining costs and of making economic comparisons. Graphs. 3 ref. (R10, A4)

206-R. The Corrosion of Machinery in H.M. Ships. L. Kenworthy. *Journal of Applied Chemistry,* v. 4, Mar. 1954, p. 97-106.

Examples of corrosion problems and remedial measures. Photographs, micrographs. 21 ref.
(R general)

207-R. Minimizing Fretting Corrosion. E. M. Johnson. *Machine Design,* v. 26, Apr. 1954, p. 348, 350, 352, 354.

Effects of lubricants, hardness and material and clearance of fits of moving parts as applied to ferrous metals. (R1, Fe)

208-R. Simple Corrosion Theory as an Aid to Materials Selection. I. T. K. Ross. *Petroleum,* v. 17, Apr. 1954, p. 116-118.

Chemical immunity, over-potential and film formation considered as phenomena contributing to corrosion resistance. Graphs, diagrams. (To be continued.) (R1)

209-R. Analysis of the Formation Current in Electrolytic Oxidation of Zirconium. J. J. Polling and A. Charlesby. *Physical Society, Proceedings,* v. 67, no. 411B, Mar. 1, 1954, p. 201-210.

Formation current consists of both ionic and electronic components. Former produces film growth; latter liberates oxygen. Separate measurements of these components. Diagram, tables. 6 ref. (R2, Zr)

210-R. Attack of Scaling-Resistant Materials by Vanadium Pentoxide and Effect of Various Alloying Elements Thereon. E. Fitzer and J. Schwab. *Henry Brutcher, Altadena, Calif., Translation no.* 3132, 15 p. (Slightly condensed from *Berg- und Hüttenmännische Monatshefte,* v. 98, no. 1, 1953, p. 1-7.)

Previously abstracted from original. See item 208-R, 1953.
(R2, Cu, Fe, Ni, SS)

211-R. Corrosion-Resistant Cemented Carbides. J. Hinnüber and O. Rüdiger. *Henry Brutcher, Altadena, Calif., Translation no.* 3135, 9 p. (Part I of "Cemented Carbides With High Resistance to Corrosion and Scaling" from *Archiv für das Eisenhüttenwesen,* v. 24, nos. 5-6, 1953, p. 267-269.)

Previously abstracted from original. See item 308-M, 1953.
(R general, M24, Cr, Ni, Co)

212-R. Testing of Stainless Steels for Intergranular Corrosion. H. J. Rocha. *Henry Brutcher, Altadena, Calif., Translation no.* 3196, 10 p. (From *Stahl und Eisen,* v. 70, no. 14, 1950, p. 608-609.)

Previously abstracted from original. See item 395-R, 1950. (R2, SS)

213-R. Process of Oxidation of Titanium Carbide-Cobalt Compositions. W. Kinna and O. Rüdiger. *Henry Brutcher, Altadena, Calif., Translation no.* 3223, 26 p. (From *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, 1953, p. 535-542.)

Previously abstracted from original. See item 129-R, 1954. (R2, Ti, Co)

214-R. (German.) **Influencing the Oil-Ash Deposition in Industrial Gas Turbine Plants by Controlling Combustion.** Peter T. Sulzer. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 2, Feb. 1954, p. 33-41.

Reduction of wear and corrosion of turbine blades and parts by ash deposits, carbon and chemical compounds. Photographs, graphs, tables, micrographs. 3 ref. (R11, Q9)

215-R. (German.) **The Influence of Condition of the Surface of Iron Upon Rapidity of Corrosion When Buried in Soil.** Tihomil Markovic. *Werkstoffe und Korrosion,* v. 5, no. 3, Mar. 1954, p. 81-83.

Current measurements with rough and smooth iron demonstrated that reversal of current direction, dependent on soil dampness, takes place between narrow limits. Graphs. 6 ref. (R8, Fe)

216-R. (German.) **Cathodic Corrosion Prevention.** Wolfgang Thury. *Werkstoffe und Korrosion,* v. 5, no. 3, Mar. 1954, p. 84-87.

Possibilities and limits of application by use of external current supplies in connection with an auxiliary insoluble anode. Iron and aluminum were subjected to various forms of corrosion. Tables. 16 ref. (R10, Al, Fe)

217-R. (German.) **Contribution to the Theory of Chemical Polarization During Solution, Separation, and Overvoltage of Metals.** Willi Machu. *Werkstoffe und Korrosion,* v. 5, no. 3, Mar. 1954, p. 87-92.

Surface layers exercise a restraining effect on adjustment of equilibrium of association. Formation continues at high rate and forms an indication of the behavior of metal in solution after preliminary treatment. Tables, graphs. 13 ref. (R1, Zn)

218-R. Resistance of Cast Fe-Ni-Cr Alloys to Corrosion in Molten Neutral Heat Treating Salts. J. H. Jackson and M. H. LaChance. *American Society for Metals, Transactions,* v. 46, 1954, p. 157-183.

Resistance of 65 alloys to corrosion in five commercial heat treating salt baths. Tables, graphs, diagram. (R5, J2, ST)

219-R. Physical Chemistry of Metal Oxidation. Leo F. Epstein. *Ceramic Age,* v. 63, Apr. 1954, p. 37-40.

Thermodynamic and kinetic factors of importance in analyzing behavior of metal-ceramic seals, or more precisely, metal-oxide combinations. Table. 19 ref. (R2, K11)

220-R. Corrosion Problems of Ammonium Sulphate Manufacture. A. W. Bamforth. *Chemical & Process Engineering,* v. 35; *Corrosion Technology,* v. 1, Apr. 1954, p. 31-35.

Materials of construction covered include stainless steels, nickel alloys, rubber-lined mild steel, lead, silicon irons, aluminum and a number of plastics. Photographs, tables, diagrams. 50 ref. (R6)

221-R. Sheet Metal Corrosion. *Chemical & Process Engineering,* v. 35; *Corrosion Technology,* v. 1, Apr. 1954, p. 38.

Results of two-year exposure tests. Photographs. (R3)

222-R. Corrosion for Chemical Engineers. Corrosion and Design. II. L. L. Shreir. *Chemical & Process Engineering,* v. 35; *Corrosion Technology,* v. 1, Apr. 1954, p. 39-42.

Design can afford protection against immersed corrosion and corrosion during finishing process. Diagrams, photograph, table. 24 ref. (R general, T29)

223-R. High Alloy Castings and Their Applications. I. *Industrial Heating,* v. 21, Apr. 1954, p. 694 + 4 pages.

Importance of high alloy castings in high-temperature and corrosion applications. Test results under various conditions. Photographs. (To be continued.) (R general, T general, CI)

224-R. Corrosion Problem Solved. Edward Trela. *Modern Metals,* v. 10, Apr. 1954, p. 72, 74, 76.

Aluminum alloy CS72A (No. 12 alloy) found less suitable than alloy S5A for duct boxes for the building trade. Corrosion precautions for exposure to moist cement. Tables, diagram, photograph. (R5, T26, Al)

225-R. Controlling Corrosion in Light Metals Finishing Plants. Robert R. Pierce. *Modern Metals,* v. 10, Apr. 1954, p. 78-80.

Protection of machinery, equipment and buildings from corrosive agents used in plants. Photographs. (R general, L general)

226-R. Cathodic Protection of the Interior of Cargo Compartments in Oil Tankers. John Lamb, E. V. Mathias and W. Godfrey Waite. *North East Coast Institution of Engineers & Shipbuilders, Transactions,* v. 70, Mar.-Apr. 1954, p. 377-393.

Galvanic method using magnesium-alloy anodes proved practicable. Results over 12 month period. Tables. (R10)

227-R. Status of Digester Corrosion in the South. R. W. Mizell and C. W. Smith. *Paper Mill News,* v. 77, Apr. 24, 1954, p. 12-13, 16.

Review of literature. 12 ref. (R7)

228-R. Corrosion in Sweetening Units. *Petroleum Refiner,* v. 33, Apr. 1954, p. 135-137.

Economic aspects of corrosion associated with two solid bed treaters. Diagram, table. (R7, ST)

229-R. Effect of Low-Temperature Stress-Relieving on Stress-Corrosion Cracking. C. R. McKinsey. *Welding Journal,* v. 33, Apr. 1954, p. 161S-166S.

Controlled low-temperature stress-relieving effective in protecting welded plates from stress-corrosion cracking. Table, photographs, micrographs. 11 ref. (R1, J1, ST)

230-R. (French.) **The Corrosion of Tin by Acetic Acid Dissolved in Organic Liquids.** René Dubrisay and Francois Arlet. *Bulletin de la société chimique de France,* 1954, no. 3, Mar., p. 314-315.

Experimental results. Characteristics of products of corrosion which vary greatly with nature of the liquid solvent. Micrograph. 13 ref. (R6, Sn)

231-R. (Italian.) **The Behavior of Titanium in Presence of a Gas at High Temperatures.** P. Spinedi. *Alluminio,* v. 23, no. 1, Jan. 1954, p. 35-39.

Oxidation at increasing temperatures in oxygen, carbon dioxide and nitrogen atmospheres. Graphs, tables. 11 ref. (R2, Ti)

232-R. (Norwegian.) **Corrosion of Steel Rods.** Ivan Th. Rosenqvist. *Teknisk Ukeblad,* v. 101, no. 12, Mar. 25, 1954, p. 237-243.

Methods for protecting steel. Proposes protection of parts by cathodic means. Photographs, table. 6 ref. (R10, ST)

233-R. Potentials of Iron, 18-8, and Titanium in Passivating Solutions. Herbert H. Uhlig and Arthur Geary. *Electrochemical Society, Journal,* v. 101, May 1954, p. 215-224.

Data for stainless steel and titanium in other passivating electrolytes. Graph, tables. 47 ref. (R10, Fe, Ti, SS)

234-R. Comparative Analysis of Digester Corrosion Measurements. TAPPI Digester Corrosion Subcommittee Summary Report No. 1. Nicholas Shoumatoff and H. O. Teeple. *Tappi,* v. 37, Apr. 1954, p. 166-171.

Industry-wide study of corrosion in alkaline digesters by numerical analysis of over 37,000 wall thickness measurements in 89 digesters in 12 different mills. Tables, graph. 12 ref. (R11, R7, ST)

235-R. (Russian.) **Oxidation of Iron in Water Vapor, Vapor-Hydrogen and Vapor-Oxygen Mixtures at High Temperatures.** V. I. Tikhomirov, V. V. Ipatsev and I. A. Gofman. *Doklady Akademii Nauk SSSR,* v. 95, no. 2, Mar. 11, 1954, p. 305-308.

Theoretical investigation closely corresponds to experimental results. Tables, graphs. (R2, Fe)

236-R. (Russian.) **Inhibitors of Atmospheric Corrosion.** S. A. Balezin and V. P. Barannik. *Doklady Akademii Nauk SSSR,* v. 95, no. 2, Mar. 11, 1954, p. 345-347.

Carbonates and benzoates showed good inhibition properties on carbon steel. Table, micrographs. 4 ref. (R10, R3, CN)

237-R. Mechanism of Corrosion Inhibition by Sodium Metaphosphate Glass. James C. Lamb, III, and Rolf Eliassen. *American Water Works Association, Journal,* v. 46, May 1954, p. 445-460.

Effects of corrosion products in water, theory of film deposition. Diagrams, graphs, table. 19 ref. (R10, Fe)

238-R. Corrosion and Its Control in Aluminum Cooling Towers. Sidney Sussman and J. R. Akers. *Corrosion,* v. 10, May 1954, p. 151-159.

Six commercial aluminum compositions were immersed in circulating waters in operating cooling towers. Serious pitting occurred with untreated and improperly treated circulating waters. Photographs, tables. 1 ref. (R4, Al)

239-R. Inspection of Petroleum Refinery Equipment. Edward H. Tandy. *Corrosion,* v. 10, May 1954, p. 160-163; disc., p. 163-164.

Conditions created by corrosive compounds in crude oils, formation of corrosive compounds during processing and use of corrosive process chemicals makes constant inspection of refinery equipment necessary. Diagram, graph, photograph. (R7)

240-R. Cathodic Protection in Florida Power and Light Company's Generating Plants. Joseph B. Prime, Jr. *Corrosion,* v. 10, May 1954, p. 165-168.

Cathodic protection of intake structures and seawater cooled condensers has proved practical and economical during the past five years. Diagrams, table. (R10, Cu, ST)

241-R. Low Carbon Stainless Resists Intergranular Corrosion. R. E. Paret. *Iron Age,* v. 173, May 6, 1954, p. 132-134.

Carbide formation in lower carbon grades occurs so slowly that normal welding and stress-relieving temperatures have no noticeable effect on corrosion resistance. Tables, photograph. (R2, SS)

242-R. Simple Corrosion Theory as an Aid to Materials Selection. II. T. K. Ross. *Petroleum,* v. 17, May 1954, p. 154-155, 184.

Differences in polarity about a metal surface may produce attack in seemingly innocuous and nearly neutral conditions. Various examples. Table, graph, diagram. (R1)

243-R. Economics of Cathodic Protection. Wayne A. Johnson. *Petroleum Engineer,* v. 26, May 1954, p. D18-D19.

Bare or coated pipe lines saved from costly leaks by cathodic protection. Graph. (R10)

244-R. Measuring Plant Corrosion Costs. V. B. Guthrie. *Petroleum Processing,* v. 9, May 1954, p. 708-709.

New technique analyzes costs proposed by study group. Table. (R general, A4)

245-R. (German.) **The Dissolution of Various Metals When in Contact With Rotating Platinum Electrodes.** Tihomil Markovic. *Werkstoffe und Korrosion,* v. 5, no. 4, Apr. 1954, p. 121-123.

Influence of cathode surface on rate of corrosion. Results indicate definite distribution of cathodic and anodic spots. Graphs, table. (R1, Zn, Al, Sn, Fe)

246-R. (Russian.) **Passivity of Iron in Concentrated Sulfuric Acid.** V. M. Novakovskii and A. I. Levin. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1113-1116.

Formula determines corrosion rate during oxidation of clean iron and corrosion of iron covered by iron sulfate. Graphs. 6 ref. (R6, R10, Fe)

247-R. (Russian.) **Composition of Photographically Active Particles Separated by Metals During Atmospheric Corrosion.** I. L. Roikh. *Doklady Akademii Nauk SSSR,* v. 94, no. 6, Feb. 21, 1954, p. 1117-1120.

Photographic effect results in separation of particles having ability to form a concealed image. Graphs. 8 ref. (R3)

248-R. (Russian.) **Resistance of Metals to Cavitation Corrosion in Fresh and Sea Water.** K. K. Shal'nev. *Doklady Akademii Nauk SSSR,* v. 95, no. 2, Mar. 11, 1954, p. 229-232.

Investigations on brass, bronze and gray cast iron reveal mechanism to be different from that formerly assumed. Graph, table, micrographs, diagrams. 14 ref. (R2, R4, Cu, CI)

249-R. (Russian.) **Electrode Potentials and Corrosion of Molybdenum and Tungsten.** A. Ia. Shatalov and I. A. Marshakov. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 1, Jan. 1954, p. 42-50.

Systematic measurement in buffer solutions with varied chlorine-ion content. Graphs, tables. 19 ref. (R11, Mo, W)

250-R. (Russian.) **Influence of Surface-Active Substances on Corrosion of Cathodic Zinc.** V. S. Kolevatova and A. I. Levin. *Zhurnal Prikladnoi Khimii,* v. 27, no. 4, Apr. 1954, p. 456-460.

Detrimental action of nickel, copper, antimony and cobalt removed by additions of glue, beta-naphthol and soaproot. Diagram, micrographs, tables. 7 ref. (R10, Zn)

251-R. Cathodic Protection. I. L. L. Shreir. *Chemical & Process Engineering,* v. 35; *Corrosion Technology,* v. 1, May 1954, p. 63-65, 78.

Principles, applications, advantages and limitations, uses. Graphs, diagram, photographs. 16 ref. (R10)

252-R. Research Laboratories Tackle Corrosion Problems. *Chemical & Process Engineering,* v. 35; *Corrosion Technology,* v. 1, May 1954, p. 77-78.

Summary of results achieved and future plans recorded in 1952-53 D.S.I.R. report. (R general, A9)

253-R. Eight Uses for Insulating Joints. A. W. Peabody. *Gas Age,* v. 113, May 6, 1954, p. 25-30, 75-81.

Corrosion protection for gas-distribution piping. Diagrams. (R10)

254-R. Practical Performance of Water-Conditioning Gadgets. B. Q. Welder and Everett P. Partridge. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 954-960.

Special devices requiring substantially no technical control are alleged to treat water by nonchemical means to prevent scale, corrosion

and troubles encountered in industrial use of water. Table. 106 ref. (R4)

255-R. Significance and Application of Water Analysis Data. R. C. Ulmer. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 975-978.

Problems of boiler water chemistry including scale, sludge, corrosion, carry-over and embrittlement. Diagram, tables, photographs. 7 ref. (R4)

256-R. Corrosion in the Boiler. R. F. Andres. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 990-992; disc., p. 992.

Resume of recent theories and developments in field of chemical treatment of boiler waters for corrosion control. 14 ref. (R4, Fe)

257-R. After Boiler Corrosion. J. J. Maguire. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 994-996; disc., p. 996-997.

Prevention of corrosion of steam and condensate lines is integral part of complete feed water conditioning program. Steam produced from boilers must not only be low in solids content but should also be noncorrosive. Photographs, table. (R4, ST)

258-R. Mechanism of Filiform Corrosion. W. H. Slabaugh and Morris Grotheer. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 1014-1016.

Workable theory for mechanism of filiform, and control by considering those postulates which are basic to mechanism. Photographs, table, diagrams. 5 ref. (R1)

259-R. Neutral and Basic Sulfonates Hayward R. Baker, Curtis R. Singleterry and Edwin M. Solomon. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 1035-1042.

Evaluation of neutral dinonylnaphthalene sulfonates as rust inhibitors in lubricating oils. Exploratory investigation of special properties of basic barium soap as rust inhibitor in acid environments. Tables, graphs. 22 ref. (R10)

260-R. Corrosion. Mars G. Fontana. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 85A-86A, 88A.

Aluminum-iron alloys with and without molybdenum show excellent oxidation resistance and low corrosion by some aqueous solutions. Tables, graph, photograph. (R2, Al, Fe, Mo)

261-R. The Influence of Extrusion Direction on the Corrosion and Stress-Corrosion of Aluminium-Copper-Magnesium Alloys. E. A. G. Liddiard and Winifred A. Bell. *Institute of Metals, Journal,* v. 82, May 1954 p. 426-432 + 1 plate.

In fully heat treated condition extrusions show little susceptibility to stress-corrosion when stress is parallel with direction of extrusion. Tables, micrographs, photograph. 3 ref. (R1, Al)

262-R. Electrical Measurements in the Selection of Bolt Materials for Service Underground. W. J. Schwerdtfeger. *Journal of Research, National Bureau of Standards,* v. 52, May 1954, p. 265-274.

Effect of exposure on potentials of cast iron and galvanized iron as components of galvanic couples. Graphs, tables, photographs. 15 ref. (R8, T7, CI, CN)

263-R. Magnesium Anodes Control Corrosion of Steel by Sea Water. *Magnesium,* 1954, May, p. 10-11.

Almost complete corrosion protection achieved in gasoline and light petroleum products tanker. Photographs, table. (R4, R10, Mg, ST)

264-R. Effect of Local-Action Currents on the Iron Potential. Herbert H. Uhlig. *National Academy of Sciences of the United States of America, Proceedings,* v. 40, May 1954, p. 276-285.

Dependence of corrosion potential on corrosion rate. Change of rate with pH. Graph. 16 ref. (R1, Fe)

265-R. Stray Currents From Cathodic Protection Installations. C. A. Erickson. *Pipe Line News,* v. 26, May 1954, p. 39, 42-45. (R10)

266-R. Comparative Analysis of Digester Corrosion Measurements. A. Ungar and T. E. Caywood. *Tappi,* v. 37, May 1954, p. 177-190.

Bulk of data supplied by alkaline pulp mills. Analysis concentrated on these. Tables, graphs. 15 ref. (R7)

267-R. (Italian.) **Theoretical and Experimental Study of Some Phenomena of Dezincification in Brasses. II. Means of Preventing Dezincification Phenomena.** Paolo Lombardi. *Metallurgia italiana,* v. 46, no. 3, Mar. 1954, p. 91-96.

Effect of addition elements. Graphs, table. (To be continued.) (R2, Zn, Cu)

268-R. (Russian.) **Corrosion of Metals by Saturated Fuel.** I. N. Putilova, L. G. Gindin and E. V. Artamonova.

Doklady Akademii Nauk SSSR, v. 94, no. 3, Jan. 21, 1954, p. 489-492.

Effect of kerosene on carbon and low-alloy steels; magnesium and its alloys. Tables. 9 ref.
(R7, Mg, CN, AY)

269-R. (Russian.) **Oxidation of Iron in Air at High Temperatures.** V. V. Ipat'ev and V. I. Tikhomirov. *Doklady Akademii Nauk SSSR,* v. 94, no. 3, Jan. 21, 1954, p. 505-508.

Rate of oxidation, composition and structure of scale produced during oxidation of Armco iron at high temperatures in dry and moist atmospheres. Diagram, graphs, photograph. 15 ref. (R2, Fe)

270-R. (Russian.) **Dependence of Iron Corrosion Velocity on the pH of KCl Salt Solution.** L. K. Lepin' and A. Ia. Vaivade. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 3, Mar. 1954, p. 435-439.

Experiments with various pH values from 3 to 9. Table, graph. 10 ref. (R11, Fe)

271-R. (Russian.) **Oxidation of Iron and Steel at High Temperatures.** N. P. Zhuk and B. V. Linchevskii. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 3, Mar. 1954, p. 440-452.

Kinetics of oxidation in a temperature range of 400 to 1100° C. Diagram, tables, graphs. 30 ref.
(R2, CI, ST)

272-R. (Russian.) **Action of Molten Chlorides of Lithium, Sodium, Potassium on Nickel, Copper, and Certain Steels.** E. I. Gurovich. *Zhurnal Prikladnoi Khimii,* v. 27, no. 4, Apr. 1954, p. 425-432.

Corrosion rates and passivation. Graphs, tables, diagram. 8 ref.
(R10, Ni, Cu, ST)

273-R. The Effect of Pesticides on Application Equipment. J. A. Kelly. *Down to Earth,* v. 10, no. 1, Summer 1954, p. 12-14.

Sprayer tank corrosion, machinery paints, abrasions and other deteriorations. Photograph, tables. 4 ref. (R general)

274-R. Mathematical Studies on Galvanic Corrosion. I. Coplanar Electrodes With Negligible Polarization. J. T. Waber. *Electrochemical Society, Journal,* v. 101, June 1954, p. 271-276.

Distribution of potential within an electrolyte produced by a coplanar arrangement of electrodes. Diagrams, table. 8 ref. (R1)

275-R. Economics of Cathodic Protection. II. Applications of Economic Analysis. Ray M. Wainwright. *Gas,* v. 30, May 1954, p. 44-48.

Six points to consider in a typical corrosion control situation. Diagram. 3 ref. (R10)

276-R. Prevention of Water Corrosion. Peter W. Sherwood. *Mining Magazine,* v. 90, May 1954, p. 275-280.

Causes of corrosion, prevention by means of inhibitors, coatings and cathodic protection. 4 ref.
(R4, R10, L general)

277-R. Control Corrosion and Improve Product Quality. F. Lawrence Resen. *Oil and Gas Journal,* v. 53, June 7, 1954, p. 111-112, 115.

New organic inhibitor neutralizes organic acids and scrubs out inorganic acids. Photographs, diagrams.
(R10)

278-R. (Russian.) **Reasons for Inhibition of Cathodic Zinc Corrosion in Presence of Surface-Active Substances.** V. S. Kolevatova and A. I. Levin. *Zhurnal Prikladnoi Khimii,* v. 27, no. 5, May 1954, p. 506-513.

Inhibiting action of additives on cathodic and anodic processes. Diagram, tables, graphs. 9 ref.
(R10, Zn)

279-R. (Book.) **Condensate Well Corrosion.** 203 p. 1953. Natural Gasoline Association of America, 422 Kennedy Bldg., Tulsa, Okla. $6.00.

Problems incident to corrosion in gas condensate wells. Information of economic nature, experimental procedure, laboratory vs. field experience correlation, ratings of efficiencies of various systems of control, and numerous case histories.
(R7)

280-R. (Book.) **Performance of Stainless Steels in Petroleum Refinery Service.** 44 p. 1953. United States Steel Corp., 525 William Penn Place, Pittsburgh, Pa. Free.

General corrosion including atmospheric, wet chemical, and elevated temperatures; and intergranular corrosion including carbide precipitation and attack by molten metals and sulfur. (R general, SS)

281-R. (Book.) **Pipe Line Corrosion and Cathodic Protection, A Field Manual.** Marshall E. Parker. 104 p. Gulf Publishing Co., P. O. Box 2608, Houston, Tex. $3.00.

Soil resistivity, potential surveys, line currents, current requirement surveys, rectifier systems for coated lines, ground bed design and installation, magnesium anodes on coated lines, hot spot protection, stray current electrolysis, interference in cathodic protection, operation and maintenance, and coating inspection and testing. (R10, ST)

282-R. (Book.) **Proceedings of the Short Course in Corrosion Held at the University of California.** 119 p. 1953. University of California, Berkeley, Calif. $5.00.

Fundamentals of stress-corrosion

of ferrous and nonferrous metals; coatings; corrosion in process industry and in public water systems; cathodic protection principles and practices; corrosion study and testing including use of radiotracer techniques; and high-temperature corrosion. (R general)

283-R. Effect of Alloy and Impurity Elements in Magnesium Alloy Cast Anodes. H. R. Robinson and P. F. George. *Corrosion,* v. 10, June 1954, p. 182-188.

Illustrates need for low impurity levels in the 6% aluminum-3% zinc magnesium alloy cast anodes. Micrograph, tables, graphs. 3 ref. (R2, Mg)

284-R. Minimizing Damage to Adjacent Structures in Urban Cathodic Protection Installations. D. T. Rosselle. *Corrosion,* v. 10, June 1954, p. 192-194.

Damage may be minimized by distributing anodes parallel to the structure to be protected and using as many small rectifiers as economically feasible. Diagram. (R10)

285-R. Laboratory Studies on the Pitting of Aluminum in Aggressive Waters. T. E. Wright and Hugh P. Godard. *Corrosion,* v. 10, June 1954, p. 195-198.

Movement of tap water reduces both pitting probability and rate: Beyond a certain velocity, no pitting occurs. Tables, diagram, photograph. 3 ref. (R4, Al)

286-R. Corrosion of Nickel Cast Irons in Soils. Irving A. Denison and Melvin Romanoff. *Corrosion,* v. 10, June 1954, p. 199-204.

Measurements of corrosion and strength of nickel cast irons after exposure to different soil conditions for a maximum of 14 yr. Tables, photographs. 4 ref. (R8, CI)

287-R. Corrosion. Mars G. Fontana. *Industrial and Engineering Chemistry,* v. 46, June 1954, p. 93A-94A, 96A.

Preparation of sample and exposure techniques in corrosion testing. Photographs. (R11)

288-R. Descaling of Evaporator Heating Surfaces in Cane Sugar Factories. N. O. Schmidt and L. F. Wiggins. *Industrial and Engineering Chemistry,* v. 46, May 1954, p. 867-870.

Experiments on prevention and removal of scale by chemical and mechanical means. Tables, photograph. 3 ref. (R2, L10, L12)

289-R. Cathodic Protection for Industrial Plants. J. H. Hirschfeld. *Industry and Power,* v. 66, June 1954, p. 66-70.

Use of magnesium and graphite anodes in 11 case histories showed distinct savings. Diagrams. (R10, Mg, C)

290-R. High-Temperature Durability of Molybdenum in Oxygen-Deficient Combustion Gases. Raymond Friedman. *Jet Propulsion,* v. 24, May-June 1954, p. 187.

Test data for uncoated molybdenum at temperatures up to 2600° F. Corrosion rates can be tolerated in many applications. (R9, Mo)

291-R. Factors Affecting the Testing of Stainless Steels in Boiling Concentrated Nitric Acid. J. E. Truman. *Journal of Applied Chemistry,* v. 4, May 1954, p. 273-283.

Effect of condenser system, amount of sexivalent chromium in acid solution, strength of acid and composition of steel. Graphs, diagrams, tables. 3 ref. (R11, SS)

292-R. Early Stages of Fretting of Copper, Iron & Steel. D. Godfrey and J. M. Bailey. *Lubrication Engineering,* v. 10, May-June 1954, p. 155-159.

Procedure included a continuous recording of friction force and microscopic examination of fretted contact areas. Diagram, micrographs, graphs. 5 ref. (R1, Cu, Fe, ST)

293-R. Avoiding Underground Corrosion. O. C. Mudd. *Petroleum Refiner,* v. 33, June 1954, p. 172-174.

Methods can increase value of present corrosion-mitigation efforts and reduce corrosion in future installations. Photographs, diagrams. (R8)

294-R. Corrosion Investigating Techniques. J. B. Armstrong. *Petroleum Refiner,* v. 33, June 1954, p. 176-179.

Field and laboratory methods to locate pitting and weak spots, measure corrosion rates, pinpoint corrosion problem and evaluate inhibitors. Diagrams. 4 ref. (R11)

295-R. Combating Corrosion Offshore. Frank Dial. *World Oil,* v. 138, June 1954, p. 206, 208, 210, 212.

Zones of attack and corrective measures for offshore drilling equipment. Photographs, table. (R4)

296-R. Magnesium Anodes Protect Aransas Bay Flow Lines. Wayne A. Johnson. *World Oil,* v. 138, June 1954, p. 246, 248, 250.

Cathodic protection of gas pipelines laid in salt water and moist land. Maps, photographs. (R10)

297-R. Effect of Microstructure on Corrosion. Herbert H. Uhlig. Paper from "Relation of Properties to Microstructure". American Society for Metals, p. 189-208.

Microstructure may have no influence on corrosion of some metals in some environments, whereas for other situations microstructure is of primary importance. Graphs, tables, micrographs, photographs. 23 ref. (R1, M27, CN, AY)

298-R. Effect on Specimen Dimensions Upon Adsorption Fatigue and Corrosion Fatigue of Steel. G. V. Karpenko and A. V. Karlashov. *Henry Brutcher, Altadena, Calif., Translation no.* 3252, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 92, no. 3, 1953, p. 603-605.)

Previously abstracted from original. See item 148-R, 1954. (R1, AY)

299-R. Effect of Heat Treatment of Titanium-Stabilized 18-9 Cr-Ni Stainless Steel With Varying C-Ti Ratio Upon Its Resistance to Intergranular Corrosion. E. I. Astrov and V. N. Biryukova. *Henry Brutcher, Altadena, Calif., Translation no.* 3258, 11 p. (From *Vestnik Mashinostroeniya,* v. 33, no. 9, 1953, p. 61-65.)

Previously abstracted from original. See item 94-R, 1954. (R2, J26, SS)

300-R. (German.) **Corrosive Effect of Water on Iron Despite the Observance of the Lime-Carbon Dioxide Balance.** A. Splittgerber. *Energietechnik,* v. 4, no. 3, Mar. 1954, p. 131-132.

Chemical investigation of cause of corrosion in pipes of steam power plant. Measures for prevention. 5 ref. (R4, R10)

301-R. (German.) **Investigations of the Porosity of Iron and Iron Oxide. I. Contribution to the Corrosion Problem of Iron.** Georg Graue. *Werkstoffe und Korrosion,* v. 5, no. 5, May 1954, p. 161-167.

Possibility of active diffusion of oxygen affecting results of experiments involving Wagner-Schottky corrosion theory. Tables, graphs. 33 ref. (R2, Fe)

302-R. (German.) **The Application of Electrochemical Methods to Investigation of Corrosion of Steel by Fluorides.** Walter Katz and Th. Kempf. *Werkstoffe und Korrosion,* v. 5, no. 5, May 1954, p. 172-177.

Evidence of passivation indicated by anodic leg of current potential curve. Graphs, micrograph, table. (R10, ST)

303-R. (Hungarian.) **Selective Corrosion of Carbon Steel.** Pal Csokan. *Ontöde,* v. 5, no. 5, May 1954, p. 114-116.

Structural investigation and interpretation of phenomenon. Photographs, micrographs. 4 ref. (R1, CN)

304-R. (Italian.) **Advantages of Anodic Oxidation of Aluminum for Water-Alcohol Solution Containers.** V. Tamburini. *Alluminio,* v. 23, no. 2, Mar. 1954, p. 151-152.

Results of experimental corrosion tests. Protective efficiency. Table. 3 ref. (R11, L19, Al)

305-R. (Italian.) **Properties of Low-Carbon, Phosphorus and Copper Alloyed Structural Steels. II. High-Temperature Oxidation. Accelerated Oxidation Phenomena of Steels in Presence of Phosphorus and Copper.** Collari Nello and Fongi Nella. *Metallurgia italiana,* v. 46, no. 4, Apr. 1954, p. 111-122.

Efficiency of phosphorus. Formation of a eutectic phase with melting temperature around 800° C. Tables, graphs, micrographs. 15 ref. (R2, ST, Cu)

306-R. (Italian.) **Theoretical and Experimental Study of Some Phenomena of Dezincification in Brasses. III. Methods for the Study of the Dezincification Phenomena and Results Obtained on Hard and Soft Alpha Single Phase Brasses and Alpha + Beta Two-Phase Brasses With Additions of Inhibitors.** Paolo Lombardi. *Metallurgia italiana,* v. 46, no. 4, Apr. 1954, p. 123-140.

Tests on two types of brasses with additions of lead, arsenic and phosphorus to determine best protection against corrosion. Micrographs, diagrams, table. 19 ref. (R2, Cu)

307-R. (Russian.) **Problem of Positive Difference-Effect.** A. F. Bogoiavlenski and L. N. Umova. *Zhurnal Prikladnoi Khimii,* v. 27, no. 5, May 1954, p. 548-551.

Explains increased localized corrosion because of the introduction of a strong cathode. Data for Zn-Pt couple in hydrochloric acid. Graphs. 3 ref. (R1, Zn)

308-R. Caustic Cracking in Steam Boilers. *British Engine, Boiler & Electrical Insurance Co. Ltd., Technical Report,* New ser., v. I, Nov. 1952, p. 9-56.

Characteristic features, detection of cracking, effect of boiler water composition. Examples. Photographs, diagrams, micrographs. (R4)

309-R. Cathodic Protection of Ships and Marine Structures. K. A. Spencer. *Chemistry & Industry,* 1954, no. 25, June 19, p. 702-708.

Principles, anodes, exterior and interior protection. Diagrams, tables. 16 ref. (R10)

310-R. The Corrosive Effects of Fluorine. *Industrial Chemist and Chemical Manufacturer,* v. 30, June 1954, p. 266-268.

Resistance of steels and nonmetallic materials. Weaknesses of piping joints and valves. 8 ref. (R5, CN, SS)

311-R. Service Experience of the Effect of Corrosion on Steel-Cored-Aluminium Overhead-Line Conductors. J. S. Forrest and J. M. Ward. *Institution of Electrical Engineers, Proceedings,* v. 101, pt. 2, no. 81, June 1954, p. 271-283; disc., p. 283-290.

Average rate of deterioration, based on the reduction in mechanical strength, is 0.4-0.5% per yr. Average service life of the conductor is 25-30 yr. Graphs, tables, diagrams, photographs. 12 ref. (R3, ST, Al)

312-R. Electrolytic Etch Cuts Corrosion Test Time. J. D. Roach and H. H. Hollenbeck. *Iron Age,* v. 173, June 24, 1954, p. 100-103.

Corrosion test time for some stainless steels can be sharply cut with a new eelctrolytic oxalic acid etch test. Tables, micrographs. (R11, SS)

313-R. Corrosion in Piping and Heating Equipment. Floyd Brown. *North Carolina State College (Engineering School Bulletin, Industrial Information Series Bulletin no.* 8), Apr. 1954, 36 p.

Corrosion in hot water storage tanks, piping, boilers and condensate return lines. Diagrams, tables, photographs. 28 ref. (R4)

314-R. Fundamental Study of Erosion Caused by Steep Pressure Waves. B. G. Rightmire and J. M. Bonneville. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3214, June 1954, 30 p.

Effect on annealed copper surfaces of steep-fronted pressure waves in oil. Cavitation of oil is the probable cause of damage. Graphs, photographs, diagrams, tables. 11 ref. (R2, Cu)

315-R. High Pressure Oxidation Rates of Metals. W. Martin Fassell, Jr., Robert C. Peterson, Donald W. Bridges and John P. Baur. Resume of paper presented at Pacific Northwest Metals and Minerals Conference of the A.I.M.E., 1954, Portland, Ore. 2 p.

Includes diagram. 3 ref. (R2)

316-R. Cathodic Protection and Galvanizing. H. A. Robinson. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 396-426.

Elements of cathodic protection and equipment in practice. Application and performance of zinc coatings. Diagrams, graphs, tables, photographs, micrographs. 24 ref. (R10, L16, Zn)

317-R. Vapour Phase Corrosion Inhibitors. A. B. Cox and E. C. Kuster. Commonwealth of Australia, Department of Supply, Defence Standards Laboratories Circular 16, Jan. 1954, 7 p.

Accelerated corrosion tests on the Shell Development Co.'s VPI-260 ("Dichan"). Table. 23 ref. (R10)

318-R. (French.) **The Structure of Oxidation Interface of Iron.** Raymond Sifferlen and Robert Collongues. *Comptes rendus,* v. 238, no. 22, May 31, 1954, p. 2167-2169.

Observation of thin zone of very fine crystals during first hour of oxidation. Micrographs. 4 ref. (R2, M26, Fe)

319-R. (German.) **Factors in the Porosity and Gas Diffusion in Ferric Oxides and Mixed Oxides. II.** Georg Graue. *Werkstoffe und Korrosion,* v. 5, no. 6, June 1954, p. 212-216.

Radioactive gases used to determine porosity of oxide films on iron. Influence of alloy composition, temperature and humidity on structure and porosity. Tables, graphs. 6 ref. (R2, M27, N1, Fe)

320-R. Resistance of Refractories to Molten Lead-Bismuth Alloy. James J. Gangler. *American Ceramic Society, Journal,* v. 37, July 1954, p. 312-316.

Corrosion resistance of 18 ceramics and cermets, 13 refractory metals and 9 high-temperature alloys to attack by 44.5% Pb, 55.5% Bi eutectic alloy. Photographs, diagram, tables. (R6, SG-h, EG-d)

321-R. Kinetics of the High Temperature Oxidation of Zirconium. Jack Belle and M. W. Mallett. *Electrochemical Society, Journal,* v. 101, July 1954, p. 339-342.

Rate of oxidation of high-purity zirconium determined for temperature range 575 to 950° C. at 1 atmosphere pressure. Graphs, table, micrographs. 8 ref. (R2, Zr)

322-R. New Oil-Soluble Antirust Agent Gives Lasting Protection for Products Pipelines. S. Kleinheksel, P. Lawrence and F. L. Nelson. *Oil and Gas Journal,* v. 53, July 12, 1954, p. 94-98.

Mechanism of corrosion inhibitors. Field tests of "Santolene C". Graphs, diagram. 7 ref. (R10, R7)

323-R. Humidity Cabinets Don't Tell the Whole Story. Louis Schlossberg. *Steel,* v. 135, July 12, 1954, p. 114-116, 118.

Concludes accelerated laboratory

corrosion tests show poor correlation with actual field results. Photographs, graphs, tables. 15 ref. (R11)

324-R. (French.) **Structure and Corrosion Fatigue of Al-Mg Alloys.** C. Panseri. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 5, May 1954, p. 152-156.

Effect of heat treatment. Micrographs, photographs, diagrams, graphs. (R1, J general, Al, Mg)

325-R. (Swedish.) **Stress-Corrosion Cracking in Mild Steel, Caustic Embrittlement.** E. Rudberg and R. Arpi. *Jernkontorets Annaler,* v. 138, no. 6, 1954, p. 350-382.

Experiments with U-bent specimens and comparisons between different test methods. Graphs, tables, diagrams. 31 ref. (R1, CN)

326-R. (Russian.) **The Mechanism of Action of Anticorrosive Additions to Mineral Oils.** B. V. Losikov, O. P. Makasheva and L. A. Aleksandrova. *Neftianoe Khoziaistvo,* v. 32, no. 4, Apr. 1954, p. 65-72.

Effect of temperature on formation and properties of protective films. Chemical nature of films. Graphs, tables. (R10)

327-R. (Book.) **Corrosion.** 60 p. 1953. Butterworth's Scientific Publications, 88 Kingsway, W.C.2, London; also Interscience Publishers, Inc., 250 Fifth Ave., New York 1. $1.75.

A series of papers on corrosion, cathodic protection of ships, prevention of corrosion by coatings, corrosion testing, and corrosion inhibitors, reprinted from *Research,* vol. 5, 1952. (Papers separately abstracted in Review of Metal Literature, vol. 9, 1952.)
(R general, L general)

328-R. Insulating Joints in Long Pipelines. I. Needs Hazards, Protection. M. C. Miller. **II. Insulating Joints.** Ralph E. Kuster. *Gas,* v. 30, July 1954, p. 98, 100, 102.

Protection against electric current and corrosion hazards. Photographs, diagrams. (R10)

329-R. Fundamentals of Underground Corrosion. Frank E. Costanzo. *Gas Age,* v. 114, July 15, 1954, p. 49-54, 78, 80.

Interpretation of measurement of electric potentials, currents and resistance. Cathodic protection. Tables, diagrams. (R8, R10)

330-R. The Oxidation of Copper in the Temperature Range 400° to 1500° F. *Industrial Heating,* v. 21, July 1954, p. 1312, 1458.

Effect of different oxidizing atmospheres. Recrystallization effect on oxide growth. (R2, Cu)

331-R. Cooling Water Gets the Treatment. L. W. Fitzpatrick. *Industry and Power,* v. 67, July 1954, p. 78-82.

Corrosion fundamentals. Treatment to control scale and slime. Chlorine treatment. Photographs, tables. (R4)

332-R. Corrosion Aspects of the Vanadium Problem in Gas Turbines. S. H. Frederick and T. F. Eden. *Institution of Mechanical Engineers, Proceedings,* v. 168, no. 3, 1954, p. 125-130 + 4 plates; disc., p. 131-134.

Effect of vanadium oxide and sodium sulfate on turbine fouling and corrosion. Nickel-base heat resisting alloys of the Nimonic type offer higher resistance to attack than the austenitic steels; some degree of protection is afforded by electrodeposited coatings of chromium. Tables, graphs, micrographs, photographs. 8 ref. (R9, Ni, SS, SG-h)

333-R. Stress-Corrosion Resisted by Additions of Ti and Ta-Cb. (Digest of "Stress-Corrosion Cracking of Non-alloyed and Low Alloyed Steels and Its Avoidance by Additions of Titanium or Tantalum-Columbium", by E. Baerlecken and W. Hirsch; *Stahl und Eisen,* v. 73, June 1953, p. 785-789.) *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. A140, A144, A146.

Previously abstracted from original. See item 438-R, 1953.
(R1, ST, AY)

334-R. (Dutch.) **Corrosion Investigation on Austenitic Stainless Steel.** A. Ph. Krijff and A. De Visser. *Smit Mededelingen,* v. 9, no. 2, Apr.-June 1954, p. 38-49.

Results of laboratory tests on different types of stainless steel. Photographs, micrographs, table, graphs. 8 ref. (R11, SS)

335-R. (French.) **Problem of Scaling and Fissuring Corrosion of Refractory Alloys in Gas Turbines.** Ph. Galmiche. *Recherche Aéronautique,* 1954, no. 39, May-June, p. 45-53.

Effects of composition of corrosive atmosphere. Table, diagram, photograph, micrographs. 15 ref. (R2, R3, SG-h)

336-R. (German.) **Protection Against Rusting of Interior of Low-Pressure Air Ducts.** Franz Eisenstecken. *Glückauf,* v. 9, nos. 25-26, June 19, 1954, p. 651-661.

Corrosion prevention in ducts carrying carbon dioxide, sulfur dioxide, and sulfur trioxide. Graphs, photographs, diagrams, table. 2 ref. (R10, R9)

337-R. (German.) **The Microscopic Forms of Iron Rust. IV.** Adolf Ack-

ermann. *Kolloid-Zeitschrift,* v. 137, no. 1, June 1954, p. 20-24.

Experimental investigations revealed characteristic forms ascribed to effect of magnetic fields. Diagrams, micrographs. 1 ref. (R2, M27, Fe)

338-R. (Italian.) **Corrosion Cells by Thermal Differentiation.** G. Bombara. *Rivista dei Combustibili,* v. 8, no. 5, May 1954, p. 329-338.

Electrolytic corrosion caused by differential heating of a metallic system in contact with an aqueous solution. Diagrams, graphs. 1 ref. (R1)

339-R. (Russian.) **Charged State of Photographically Active Particles Precipitated by Metals During Atmospheric Corrosion.** I. L. Roikh and A. I. Shcherbak. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 5, May 1954, p. 769-771.

Effect of particles on photographic plate similar to effect of light. Diagram. 10 ref. (R3, P17)

340-R. (Russian.) **Electrochemical Behavior of Iron in Hot Concentrated Solutions of Alkali. I-II.** V. V. Losev and B. N. Kabanov. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 5, May 1954, p. 824-836, 914-925.

Capacitance of electrode during three processes. Effect of concentration of iron ions in solution on the anode process. Reversible nature of passivation of iron electrode. Tables, graphs. 25 ref. (R6, R10, Fe)

341-R. Sound Applications for Zinc Anodes. A. W. Peabody. *American Zinc Institute, Journal,* v. 32, 1954, p. 73-80.

Use of zinc anodes in cathodic protection of ships, water storage tanks, pipelines and electric generating stations. (R10, T general, Zn)

342-R. Galvanic Action Corrodes Through Bolts. Fred M. Reiter. *Electrical World,* v. 142, July 26, 1954, p. 118, 127.

Corrosion of bolts in poles supporting electric power lines. Corrective measures. (R1, CN)

343-R. The Performance of Aluminium Roofing Under Industrial Conditions. *Mechanical World and Engineering Record,* v. 134, July 1954, p. 300-303.

Case histories reveal high standard of durability in a variety of atmospheres. Graphs, table. (R3, Al)

344-R. (French.) **Speeds of Solution of Iron and Aluminum in Aqueous Hydrochloric Acid Solutions.** T. G. Owe Berg. *Journal de chimie physique,* v. 51, no. 4, Apr. 1954, p. 141-160.

Relation of dissolving times to acid concentrations and temperature. Graphs, tables. 9 ref. (R5, Fe, Al)

345-R. (French.) **Abnormal Corrosion Products on Protected Metals.** E. Geffroy. *Métaux, Corrosion-Industries,* v. 29, no. 345, May 1954, p. 212-215.

Comparison of various platings. Problem of crystalline build-ups causing short circuits and unsteady voltage. Table. (R3)

346-R. (French.) **Inhibition and Activation.** J. Frasch. *Métaux, Corrosion-Industries,* v. 29, no. 345, May 1954, p. 216-224.

Theory of corrosion and its prevention by anodic and cathodic polarization. Tables, diagrams, graphs, micrograph. (R10)

347-R. (German.) **Cathodic Protection With Magnesium Anodes Against Soil Corrosion.** Werner Rausch. *Gas und Wasserfach,* v. 95, Ausgabe Gas, no. 13, July 1, 1954, p. 416-421.

Requirements, installation of equipment and efficiency. Graphs, photograph, diagram. 15 ref. (R10, R8, ST)

348-R. Some Observations of Cathodic Protection Potential Criteria in Localized Pitting. T-2-C Report. Pub. 54-2. *Corrosion,* v. 10, Aug. 1954, p. 232-236.

Minimum current requirements for cathodic protection Diagrams, tables, graph. 9 ref. (R10)

349-R. Survey of Corrosion Control in California Pumping Wells. Frank E. Davie and Preston W. Hill. *Corrosion,* v. 10, Aug. 1954, p. 248-251; disc., p. 251.

Use of inhibitors resulted in an average of 50% reduction in pulling jobs. Material replacements greatly reduced. Graphs, tables. (R10)

350-R. A Method of Considering Costs While Selecting Materials for Corrosion Service. E. F. T. Rice. *Corrosion,* v. 10, Aug. 1954, p. 252.

Suggested corrosion rating guide includes cost factor by providing separate corrosion limits for metals of various price range. Table. (R general)

351-R. A Promising Spray-Applied Inhibitor of Internal Corrosion of Oil Tank Ships. J. D. Sudbury, D. A. Shock and F. W. Mann. *Corrosion,* v. 10, Aug. 1954, p. 253-258.

Good results shown with an inhibitor incorporating calcium and sodium sulfonates, but hydrocarbons with lower flash points are sought.

Photographs, diagrams, tables, graphs. 4 ref. (R10)

352-R. Beginnings of Corrosion Prevention. Robert H. Pope. *Corrosion,* v. 10, Aug. 1954, p. 259.

Early public utility problems in underground corrosion and methods of prevention. (R8)

353-R. Selecting Gaskets to Limit Corrosion of Stainless Steel Bolted Joints in a Chemical Plant. E. V. Kunkel. *Corrosion,* v. 10, Aug 1954, p. 260-266.

Corrosion control by proper selection of gasket material, proper joint design and modification of corrosion characteristics of the process fluid being handled. Photographs, diagrams, tables. (R5, R6, SS)

354-R. Organizing and Operating a Successful Program of Corrosion Mitigation. M. G. Markle. *Corrosion (News Section),* v. 10, Aug. 1954, p. 22, 24-25.

Enlightening management on benefits of a corrosion prevention program and how it can be accomplished economically. (R general)

355-R. Formation of Anodic Oxide Films on Cathodes. D. A. Vermilyea. *Electrochemical Society, Journal,* v. 101, Aug. 1954, p. 389-392.

Tantalum oxide may be formed on tantalum when the tantalum potential on the hydrogen scale is negative. Experimental results and discussion. Diagrams, graphs. 2 ref. (R2, R11, Ta)

356-R. Corrosion of Aluminum in Potassium Chloride Solutions. I. Effects of Concentrations of KCl and Dissolved Oxygen. W. Beck, F. G. Keihn and R. G. Gold. *Electrochemical Society, Journal,* v. 101, Aug. 1954, p. 393-399.

Weight loss increased with time and increasing oxygen concentration but decreased with increasing electrolyte concentration. Tables, graphs, diagram. 21 ref. (R5, Al)

357-R. Studies on the Anodic Polarization of Zirconium and Zirconium Alloys. Mario Maraghini, George B. Adams, Jr., and Pierre Van Rysselberghe. *Electrochemical Society, Journal,* v. 101, Aug. 1954, p. 400-409.

Corrosion potentials in various electrolytes. Factors affecting oxide film formation. Tables, graphs. 7 ref. (R11, Zr)

358-R. Cut Deethanizer Corrosion 92%. *Petroleum Processing,* v. 9, Aug. 1954, p. 1192-1193

Injection of organic inhibitor protects metal in reflux lines for Sun Oil Co. Diagram, photograph. (R10)

359-R. (German.) **The Mechanism of Oxidation of Iron and Alloy Steels at Higher Temperatures.** K. Hauffe. *Metalloberfläche,* Ausgabe A, v. 8, no. 7, July 1954, p. 97-103.

Lattice structures, diffusion of oxygen and alloying elements in connection with oxidation and design of oxidation resistant steels. Graphs, micrograph, table, diagram. 35 ref. (R2, Fe, AY)

360-R. (German.) **Discontinuous Films on Copper.** E. Menzel and W. Stössel. *Naturwissenchaften,* v. 41, no. 13, July 1954, p. 302-303.

Oxidation of high-purity copper at low-oxygen pressures. Micrographs. 5 ref. (R2, Cu)

361-R. (German.) **Protection of Metals by Means of Corrosion Inhibitors.** A. Bukowiecki. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 6, June 1954, p. 169-186.

Critical review on inhibitors and mechanism of inhibition. Graphs, tables. 121 ref. (R10)

362-R. (German.) **Double-Layer Build-Up on Iron and Lead Electrodes in Soils.** Tihomil Markovic and P. Kirkov. *Werkstoffe und Korrosion,* v. 5, no. 7, July 1954, p. 241-243.

Data agree with previous corrosion tests. Table, graphs. 4 ref. (R8, Fe, Pb)

363-R. (German.) **The Influence of Soil Dampness on Corrosion Rates of Iron and Lead in the Earth.** Tihomil Markovic. *Werkstoffe und Korrosion,* v. 5, no. 7, July 1954, p. 244-246.

Corrosion mechanisms in various soils. Graphs. 4 ref. (R8, Fe, Pb)

364-R. (German.) **Corrosion Protection in the Processing of Copper Solutions.** Wilhelm Teworte. *Zeitschrift für Metallkunde,* v. 45, no. 6, June 1954, p. 387-391.

Materials and techniques for equipment used in hydrometallurgy of copper. Diagrams, photographs. (R10, B14, Cu)

365-R. Corrosion Is a Major Cause of Wear in Engine Cylinders. Oscar W. Wuerz. *Automotive Industries,* v. 111, Aug. 1, 1954, p. 60-61.

Additive-type oil results in saving in labor, material and lost revenue time. Graphs, table. (R7, Q9)

366-R. Borax Solutions Found to Inhibit Rusting. Fred W. Blaisdell. *Civil Engineering,* v. 24, Aug. 1954, p. 537-538.

Effects on specific gravity, surface tension and kinematic viscosity of water can be neglected in ordinary hydraulic laboratory work. Graphs. (R10, ST, Zn)

367-R. Comparisons of Cathodic Protection Test Methods. Kirk H. Logan. *Corrosion,* v. 10, July 1954, p. 206-210; disc., p. 211.

Four methods compared in three soil types. Graphs. 8 ref. (R10, CN)

368-R. Some Experiences With Cathodic Protection in Chicago. L. M. Plym. *Corrosion,* v. 10, July 1954, p. 213-214.

Protection for lead-sheathed telephone cables. Table, diagram. (R10, Pb)

369-R. Chromate for Corrosion Control in Methanol Antifreeze. George E. Best and Eugene A. Roche. *Corrosion,* v. 10, July 1954, p. 217-223; disc., p. 223.

Two-year study shows that 5000 p.p.m. of Na_2CrO_4 is adequate inhibitor. Photographs, tables. 22 ref. (R10)

370-R. Industrial Applications of a Method for Measuring Small Amounts of Corrosion Without Removal of Corrosion Products. Andrew Dravnieks and Horace A. Cataldi. *Corrosion,* v. 10, July 1954, p. 224-230.

A simple, electrical resistance method. Diagrams, graphs, table. 13 ref. (R11)

371-R. High Temperature Oxidation Characteristics of Some Manganese-Aluminium Steels. I. A. A. Krishnan and Ved Prakash. *Journal of Scientific & Industrial Research,* v. 13, sec. B, June 1954, p. 444-449.

Oxidation characteristics obey parabolic law at 600 to 700° C. Effects of manganese and aluminum additions. Graphs, tables, micrographs. 6 ref. (R2)

372-R. Wear and Corrosion of Materials in High Temperature Water. R. C. Westphal and J. Glatter. *Materials & Methods,* v. 40, Aug. 1954, p. 100-101.

How a wide range of corrosion resistant materials will stand up under the unusual bearing conditions encountered in nuclear power plants. Photograph, table. (R4, Q9)

373-R. Corrosion of Pump Parts. Edward H. Huss. *Metal Progress,* v. 66, Aug. 1954, p. 100-102.

Dynamic corrosion tests on nickel alloys, stainless steels and other metals. Diagrams, photograph, table. (R11, SS, Ni, SG-g)

374-R. Sleeve-Bearing Alloys Susceptible to Cavitation Damage. (Digest of "The Resistance of Some Cast and Plated Sleeve-Bearing Materials to Cavitation Erosion", by R. A. Schaefer, J. F. Cerness and H. A. Thomas; *Transactions of the Institute of Metal Finishing,* 1954.) *Metal Progress,* v. 66, Aug. 1954, p. 170, 172.

Tests to determine the extent and probability of cavitation damage to tin-base and lead-base babbitts with and without antimony additions, Cu-Pb, Cu-Pb-Sn, Cd-Ni, Al-Sn-Cu-Ni, as well as samples of pure lead, silver, copper, and tin. (R2, SG-c)

375-R. (English.) **How the Addition of Metals Affects Sulphurization-Resistant Property of Cast Iron at High Temperature.** Masakazu Shiozawa and Hiroshi Nakai. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 11-13.

Effect of aluminum, manganese, molybdenum and silicon on resistance of cast iron to fumes containing sulfur compounds. Tables, graph, diagram. (R6, CI)

376-R. (English.) **Electron Diffraction Studies on the Nature of the Corrosion and Heat Resistances of Titanium.** Tadayuki Nakayama. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 57-59.

Studies of the protective film formed on the surface of titanium on exposure to salt water. Tables, diagram, photograph. 4 ref. (R4, R11, M22, Ti)

377-R. (French.) **Titanium and Corrosion.** C. More. *Métallurgie et la construction mécanique,* v. 86, nos. 7-8, July-Aug. 1954, p. 581-582.

Corrosion resistance properties of titanium and its alloys. 5 ref. (R general, Ti)

378-R. Where to Place the Reference Electrode on a Pipeline. Leon P. Sudrabin and Joseph A. Lehmann. *American Gas Journal,* v. 181, Aug. 1954, p. 16-17, 35.

Subsurface potential calculations to establish effectiveness of cathodic protection. Diagrams. 4 ref. (R10, ST)

379-R. The Performance of Aluminium in Ships. D. C. G. Lees. *Chemistry & Industry,* 1954, no. 31, July 31, p. 949-955.

Examples. Corrosion and protective anodes and joints and protective treatments. Photographs, diagrams. 7 ref. (R10, T23, Al)

380-R. Corrosion Control on a Products Pipeline. *Canadian Metals,* v. 17, Aug. 1954, p. 16, 18.

Experience and practical aspects of cathodic protection. (R10)

381-R. Prevention of Water Corrosion in Mining Operations. Peter W. Sherwood. *Canadian Mining Journal,* v. 75, Aug. 1954, p. 72-75.

Six methods of reducing corrosive action suggested. (R4)

382-R. (Russian.) **Contact Corrosion of Magnetic Alloys and Protection by**

Metallic and Oxide Coatings. A. V. Shreider. *Zhurnal Prikladnoi Khimii,* v. 27, no. 7, July 1954, p. 735-756.

Corrosive media. Chemical composition of alloys. Macro-cathode materials. Corrosion tests. Technology of coatings and platings; comparative results. Tables, graphs, diagrams, photographs. 16 ref. (R general, L general, SG-n)

383-R. Stress Corrosion in High Tensile Wire. W. O. Everling. *American Iron and Steel Institute, Preprint,* 1954, 19 p.

Tests on high-carbon wire for use in prestressed concrete. Oil tempered wire was more sensitive than hard drawn. Photographs, tables, graphs, diagrams, micrographs. (R1, CN)

384-R. Stress Corrosion in Stainless Steel. R. A. Lincoln. *American Iron and Steel Institute, Preprint,* 1954, 9 p.

Causes, tests and prevention of service failures. 8 ref. (R1, SS)

385-R. Testing of Materials for Naval Shipboard Sea Water Carrying Systems—A Review. J. W. Jenkins and J. B. Guerry. *American Society of Naval Engineers, Journal,* v. 66, Aug. 1954, p. 607-639.

Corrosion tests of various metals and alloys in pipes, valves, pumps and other equipment. Photographs, diagram, tables. 5 ref. (R11, R4)

386-R. Valves to Combat Corrosion. *Chemical Engineering,* v. 61, Sept. 1954, p. 198-204.

Results from "valve clinics" held in seven industrial centers. (R general)

387-R. High-Silicon Cast Iron Tested for Use With Impressed Currents. Walter A. Luce. *Corrosion,* v. 10, Sept. 1954, p. 267-268.

Tests show 14.5 silicon iron satisfactory for anodes in cathodic protection systems. Photographs, tables. (R10, CI)

388-R. Pitting Corrosion Characteristics of Aluminum—Influence of Iron and Silicon. P. M. Aziz and Hugh P. Godard. *Corrosion,* v. 10, Sept. 1954, p. 269-272.

Addition of iron or silicon increases pitting probability and pitting rate of super purity aluminum. No significant increases noted for commercial grades. Tables, graphs. 3 ref. (R2, Al)

389-R. Relation of Corrosion to Business Costs. Aaron Wachter. *Corrosion,* v. 10, Sept. 1954, p. 273-278.

Direct and indirect effects of corrosion on costs of operating a business. Diagram. 6 ref. (R general, A4)

390-R. Corrosion of Bronze Oil-Sealing Sleeves in Centrifugal Gas Compressors. Edward C. Greco. *Corrosion,* v. 10, Sept. 1954, p. 279-283.

Tests show dust from gas pipe line caused corrosion of bronze but had no effect on steel, aluminum, Monel, Inconel, nickel or cast iron. Tables, graphs, photographs. 3 ref. (R9, Cu, CN, Al, Ni, CI)

391-R. Corrosion Control in Gas Lift Wells. II. Evaluation of Inhibitors. D. A. Shock and J. D. Sudbury. *Corrosion,* v. 10, Sept. 1954, p. 289-294.

Corrosion inhibitors for use in wells producing corrosive water. Photographs, graphs, tables, micrographs. 8 ref. (R10, CN)

392-R. Oxidation of Plain, Alloyed and Ductile Irons at 1300 Degrees F. J. A. Cameron. *Corrosion,* v. 10, Sept. 1954, p. 295-297; disc., p. 297-298.

Tests up to 4000 hr. show ductile iron to be more resistant than flake graphite irons. Diagram, tables, graphs. (R2, CI)

393-R. Pipe-Type Cable Corrosion Protection Practices in the Utilities Industry. *Corrosion,* v. 10, Sept. 1954, p. 299-313.

Data compiled from field practices of 17 operators. Materials, coatings, testing and related information. Tables. (R10, CN)

394-R. Scale Formation and Corrosion Cracking in Heat-Resisting Alloys for Gas Turbines. P. Galmiche. *Engineers' Digest,* v. 15, Aug. 1954, p. 323-325. (From *La Recherche Aéromautique,* 1954, no. 39, May-June, p. 45-53.)

Previously abstracted from original. See item 335-R, 1954. (R2, R3, SG-h)

395-R. Electron Optical Study of Oxidation of High Purity Iron at Low Oxygen Pressures. Earl A. Gulbransen, William R. McMillan and Kenneth F. Andrew. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1027-1035.

Oxidation occurs discontinuously over the surface and orients with substructure of the metal grains. Tables, micrographs, diffraction pattern, diagram. 13 ref. (R2, M27, Fe)

396-R. High Pressure Oxidation of Metals: Tantalum in Oxygen. Robert C. Peterson, W. Martin Fassell, Jr., and Milton E. Wadsworth. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1038-1044.

Temperature and pressure dependence from 500 to 1000° C. at 10 mm.

Hg to 600 psi. oxygen pressure. Photograph, diagrams, graphs, tables. 13 ref. (R2, Ta)

397-R. Corrosion Control and Prevention. L. R. Honnaker. *Paint Industry Magazine,* v. 69, Aug. 1954, 42, 44-47.

Covers types of corrosion, use of plastics, rubber liners and coatings. (R general, L general)

398-R. Why Cars Corrode. *Railway Locomotives and Cars,* v. 128, Sept. 1954, p. 63-65.

Corrosion, causes and prevention, in tank and refrigeration cars. (R1, R10)

399-R. Stress Corrosion of 12% Cr Stainless Steel. W. L. Badger. *SAE Transactions,* v. 62, 1954, p. 307-310; disc., p. 310-313.

Compressor rotor blade cracking eliminated by stress relief at 950° F. Superior performances shown by use of three alloys over type 403. Graphs, photographs, tables, micrographs, diagram. 1 ref. (R1, J1, SS)

400-R. (Italian.) **Phenomena of Passivity of Metals and Alloys.** R. Piontelli. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 5-28.

Theoretical study. Tables, charts. 9 ref. (R10)

401-R. (Italian.) **Passivity of Zinc in Relation to Conditions of Aeration.** G. Bianchi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 29-30; disc., p. 30.

Zinc in a solution of sodium chloride considered in study of corrosion by galvanic macroelements. Charts. (R10, Zn)

402-R. (Italian.) **Aspects of the Influence of Oxygen in Wet Corrosion Phenomena.** G. Bianchi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 30-31; disc., p. 32.

Overvoltage of cathodic reduction and diffusion of oxygen. Charts. (R10)

403-R. (Italian.) **Passivity Phenomena in Stainless Steels.** A. Ferri. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 33.

Measurement of electrochemical potential in 1*N* sulfuric acid, at 30° C., of 18-8 stainless steel. Tables. 2 ref. (R10, SS)

404-R. (Italian.) **Passive States Produced by Oxidizing Agents on Common and Special Steels.** A. Indelli. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 34-35.

Study of action of chromates and nitrites on anodic and cathodic reactions. 14 ref. (R10, ST)

405-R. (Italian.) **Use of Metallic Materials and Corrosion in the Chemical Industry.** G. Pastonesi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 37-41; disc., p. 41.

Applications of nickel-base alloys, weld deposited alloys and other nonferrous materials. Corrosion phenomena in the chemical industry. (R general, T29, Ni, SS, Al)

406-R. (Italian.) **Influence of Liberated Gases on the Pitting of Stainless Steels.** C. Bighi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 42-43.

Theoretical study. Table, diagram. 9 ref. (R2, SS)

407-R. (Italian.) **Method of Estimating the Local Corrosion Current on Zirconium.** M. Maraghini and P. Van Rysselberghe. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 45-46.

Method uses artificial separation of the anodic and cathodic zones. Diagrams. 4 ref. (R11, Zr)

408-R. (Italian.) **Some Problems of Corrosion and Means of Combatting It in a Petroleum Refinery.** P. Daino. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 47-50; disc., p. 50.

Main causes of corrosion and defense against it by use of alkaline neutralizers, inhibitors, alloy and special steels, protective coatings and cathodic protection. Photographs. 5 ref. (R1, R10, L general, ST)

409-R. (Italian.) **Drinking Water and Its Corrosive Action on Ferrous Materials.** R. Sandrinelli. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 54-58; disc., p. 58.

Precautions to be taken by manufacturers of water pipe lines and mains to prevent corrosion. Charts. 12 ref. (R4, CI, ST)

410-R. (Italian.) **Anticorrosive Protection by Means of Substances Having an Inhibiting Action.** L. Cavallaro. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 59-63; disc., p. 63.

Industrial applications of several inhibitors. (R10)

411-R. (Italian.) **Contribution to the Study of Inorganic Inhibitors.** U. Bertocci. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 64-65; disc., p. 65-66.

Influence of arsenic, antimony and tin on the attack of metals of the iron group by hydrochloric acid solutions. Charts. 12 ref. (R10, R5, Fe, Co, Ni)

412-R. (Italian.) **Use of Inhibitors in the Chemical Cleaning of Boilers.** B. Domenicali. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 69; disc., p. 69, 88.

Method consists in use of a dilute hydrochloric acid solution (max. concentration 5%), inhibited with one unit of inhibitor per liter. (R10, ST)

413-R. (Italian.) **Research on Vapor Phase Inhibitors.** G. Mantovani. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 75-76.

Protection of metallic structures with substances volatizing at room temperature. Tables, photographs. 10 ref. (R10, ST)

414-R. (Italian.) **Corrosion and Protection of Underground Metallic Materials.** M. Jacopetti. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 79-87; disc., p. 88.

Causes and prevention of corrosion in pipes, conduits and tubes, and recent research in this field. 65 ref. (R8, ST)

415-R. (Italian.) **Inquiry Into Some Cases of Corrosion in Radiant-Panel Heating Pipes.** E. Donati and G. Beretta. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 91-95; disc., p. 95.

Seven cases of corrosion and remedies. Photographs. 9 ref. (R3, ST)

416-R. (Italian.) **Cathodic Protection of Undeground Metallic Cables and Structures.** E. Gerosa. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 96-97; disc., p. 97.

Cathodic protection by reactive anodes, polarized drainage and impressed e.m.f. (R10)

417-R. (Italian.) **Economic Aspects of Cathodic Protection.** T. Nanni and A. Compostella. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 98-100.

Economic advantages of cathodic protection. Table. 6 ref. (R10)

418-R. (Italian.) **Contribution to the Study of Hot Oxidation of Metals and Alloys.** F. De Carli and P. Spinedi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 101-107; disc., p. 107.

Tests on iron, copper, titanium, copper-tin and copper-aluminum. Effects of allotropic modifications, stability of oxides, composition of oxidized layers and composition of alloys. Diagrams. 18 ref. (R2, Fe, Cu, Ti, Sn, Al)

419-R. (Italian.) **Methods of Testing and Checking in the Field of Metal Corrosion.** G. Bianchi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 109-112.

Testing by immersion in static solutions, immersion in agitated and aerated solutions, saline fog and by alternating immersion. 2 ref. (R11)

420-R. (Italian.) **Methods of Testing the Action of Pigments in Varnishes.** C. Bighi and G. Mantovani. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 117-118.

Microamperometer, electrolytic cell, liquid attack, and industrial corrosive atmosphere tests. Photograph. 7 ref. (R11, L26)

421-R. (Italian.) **Estimating Inhibiting Power by Means of Polarization Curves.** G. Bombara. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 119-120.

Advantages of method. 1 ref. (R10)

422-R. (Italian.) **Use of Electrochemical Methods in the Testing of Materials.** L. Cavallaro and A. Indelli. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 120-121.

Disadvantages of electrochemical testing of corrosive properties. 15 ref. (R11)

423-R. (Italian.) **Methods of Corrosion Testing at the Istituto Sperimentale dei Metalli Leggeri.** G. Luft. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 122-124; disc., p. 124.

Eight methods used for estimating the corrosion resistance of aluminum alloys. Photographs, diagrams. 12 ref. (R11, Al)

424-R. (Italian.) **Analyses of Metallic Sound as a Measurement of Intercrystalline Corrosion in 18-8 Stainless Steel.** O. Masi and A. Ferri. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 125-127; disc., p. 128, 140.

Theory, techniques and applications. Tables, photographs, graphs. (R2, SS)

425-R. (Italian.) **Continuous Polarographic Investigation of the Kinetics of Corrosion.** L. Riccoboni, P. Papoff, and V. Genta. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 129; disc., p. 144.

Equipment and techniques. (R11)

426-R. (Italian.) **Research and Information Services Available in the Fight Against Corrosion.** M. Pourbaix. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 136-140; disc., p. 140.

Research work and organization of the Belgian Center of Corrosion Study. 13 ref. (R general, A9)

427-R. (Italian.) **Italian Standardization in the Field of "Corrosion of Metallic Materials".** *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 141.

General program. (R general, S22)

428-R. (Italian.) **Corrosion Committee of the Societa Montecatini and Some Problems it Has Solved.** E. Hugony. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 145-146.

Research on alumnium cans for hydrogen peroxide, cooling-water pipes for coolers and lead-antimony valves for phosphorus chloride or oxychloride plants. Photographs, diagrams. (R11, Al, Pb, Sb)

429-R. (Italian.) **Organization and Activity of Research and Testing in the Field of Corrosion at the Breda Istituto di Ricerche Scientifiche Applicate all'Industria.** L. Matteoli. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 147-148.

Current activity. 31 ref. (R11, A9)

430-R. (Italian.) **Research Center for the Marine Corrosion of Metals.** M. Raffo. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 149-150.

Work over period from Apr. 1951 to June 1953. (R4, A9)

431-R. (Italian.) **Nickel Information Centers. Their Activity in the Fight Against Corrosion.** C. Galletto. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 151.

Program in such centers throughout the world. (R general, A9, Ni)

432-R. (German.) **How Do the Mysterious Grooves on Railroad Rails Arise?** Max Fink. *Umschau in Wissenschaft und Technik,* v. 54, no. 16, Aug. 15, 1954, p. 499-502.

Experiments show that grooves and waves on rail surfaces are caused by work hardening effect of the rolling-and-gliding wheels. This increases chemical activity of steel, and hence its oxidation. Photographs. 7 ref. (R2, CN)

433-R. (German.) **The Reading Accuracy in Measuring Corrosion and Thickness With Ultrasonic Impulses.** A. Lutsch. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 23, Aug. 11, 1954, p. 773-777.

Use of the ultrasonic reflectoscope for detecting and measuring small and large areas of corrosion on inaccessible places and for measuring the thickness of sheet metal. Tables, diagrams. 6 ref. (R11, S14)

434-R. (Russian.) **Electrochemical Investigation of Passivated Iron.** L. V. Vaniukova and B. N. Kabanov. *Zhurnal Fizicheskoi Khimii,* v. 28, no. 6, June 1954, p. 1025-1035.

Electrode potential and quantity of electricity. Polarization curves and measurements of electrode capacitance. Fast and slow anodal processes of oxidation. Effect of chlorine on oxidation. Tables, graphs, diagram. 22 ref. (R10, Fe)

435-R. (Book.) **Bibliographic Survey of Corrosion 1948-1949.** Publication No. 54-1. 346 p. 1954. National Association of Corrosion Engineers, 1061 M & M Building, Houston 2, Texas. Members $10.00, nonmembers $12.50.

Compilation of 3500 abstracts from some 500 periodicals and books by over 30 abstracting agencies. (R general, A10)

436-R. (Pamphlet.) **Corrosion Control for Screwjack Materials.** Wright Air Development Center. Report no. PB111318. 1951. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $1.00.

Evaluation of 18 protective coatings to replace oils. (R10, L general, ST)

437-R. (Book.) **Corrosion Data Survey.** G. A. Nelson. 1954. Shell Development Co., Emeryville, Calif. $35.00.

Summarizes data so that feasible metals for construction of different types of equipment may be easily chosen. (R general)

438-R. **Cathodic Protection for the Fleet.** Jack Driller. *Bureau of Ships Journal,* v. 3, Sept. 1954, p. 14-17.

Systems used and work in progress. Diagram, photographs. (R10)

439-R. **Corrosion Inhibitors and Polarographic Maxima.** Harry C. Gatos. *Electrochemical Society, Journal,* v. 101, Sept. 1954, p. 433-441.

Results of polarographic studies of number of corrosion inhibitors, particularly for the iron-sulfuric acid system. Graphs, photograph, tables. 19 ref. (R10, Fe)

440-R. **Corrosion Properties of Titanium in Marine Environments.** H. B. Bomberger, P. J. Cambourelis and G. E. Hutchinson. *Electrochemical Society, Journal,* v. 101, Sept. 1954, p. 442-447.

Behavior of commercially pure titanium and several common structural metals exposed up to five years at Kure Beach, N. C. Tables, photographs. 12 ref. (R3, R4, Ti)

441-R. **Jet Impingement Tests.** P. T. Gilbert and F. L. LaQue. *Electrochemical Society, Journal,* v. 101, Sept. 1954, p. 448-455.

Studies of failure of certain condenser tube alloys as a result of corrosion-erosion produced by salt water moving at moderately high velocity. Tables, photographs. 7 ref. (R1, R4, Ni, Cu)

442-R. The Utility of Thermodynamic Interpretation of Polarization Curves. Marcel Pourbaix. *Electrochemical Society, Journal,* v. 101, Sept. 1954, p. 217C-221C.

Discussion and application to prediction of conditions of corrosion and passivity of metals and alloys. Behavior of mild steel in a bicarbonate medium, behavior of stainless steel in acetate buffer, influence of chlorides, action of chlorides on the corrosion of iron and the remedy for this action and prevention of localized corrosion. Diagrams, graphs. 19 ref. (R10, R11, ST)

443-R. Corrosion. Mars G. Fontana. *Industrial and Engineering Chemistry,* v. 46, Sept. 1954, p. 85A-86A, 88A.

Oxidizing effects of aeration and expressions for corrosion rate. Graphs. (R10)

444-R. How to Prevent Stress-Corrosion-Cracking in Aluminum Parts. R. N. Hooker and J. L. Waisman. *Iron Age,* v. 174, Sept. 9, 1954, p. 123-125; Sept. 16, p. 165-167.

Improved design, use of forgings, low stress levels and coatings are factors to consider. Photographs, micrographs, charts. (R1, Al)

445-R. Maintenance Aspects of Corrosion Program at Fairless Works. K. L. Johannsen. *Iron and Steel Engineer,* v. 31, Sept. 1954, p. 115-121; disc., p. 121-122.

Design and maintenance problems in preventing underground corrosion in large installation. Diagrams, photographs, tables, graphs. 6 ref. (R8)

446-R. Present Status of Cavitation Research. Robert T. Knapp. *Mechanical Engineering,* v. 76, Sept. 1954, p. 731-734.

Review of effect of cavitation on performance of hydraulic devices and losses from mechanical and corrosion damage. 6 ref. (R2)

447-R. Stressed Alpha Brass in Sea Water and Ammonia. A. R. Bailey and W. H. Lowther. *Metal Industry,* v. 85, Aug. 13, 1954, p. 126-127.

Relationship between marine environment and stress-corrosion cracking. 21 ref. (R1, R4, Cu)

448-R. Season Cracking of Brass. H. A. Unckel. *Metal Industry,* v. 85, Aug. 27, 1954, p. 167-168.

Causes and mechanism of stress-corrosion cracking. Photograph. 6 ref. (R1, Cu)

449-R. Some Aspects of Stress Corrosion Cracking. Thomas P. May. Paper from "Yearbook of the American Iron and Steel Institute", p. 206-213; disc., p. 213.

Possible mechanisms and role of hydrogen. Suggests study of relation of chloride ion in corrosion of stainless steels. 14 ref. (R1, ST)

450-R. (Dutch.) **Cathodic Protection Against Corrosion.** T. van der Klis. *Bedrijf en Techniek,* v. 9, no. 208, Aug. 14, 1954, p. 380-383.

Protection of metals embedded in the soil against electrochemical corrosion. Diagrams. 8 ref. (R10)

451-R. (French.) **Test on the Application of Magnetic Fields to Scaling Problems.** Jean Pajot. *Flamme et Thermique,* v. 7, no. 66, Mar. 1954, p. 43, 45.

Phenomena occurring when a solution is passed through a strong magnetic field, causing a slimy deposit. (R2, R11)

452-R. (Italian.) **Preliminary Research Concerning the Possible Influence of Bacterial Metabolism on the Corrosion of Aluminum Caused by Stagnating Water.** L. Ranucci-Gatto. *Alluminio,* v. 23, no. 4, 1954, p. 399-411.

Effects of sulfur-reducing bacteria. Photographs, tables, graphs. 11 ref. (R1, R4)

453-R. Stress-Corrosion Mechanism in a Magnesium-Base Alloy. D. K. Priest, F. H. Beck and M. G. Fontana. *American Society for Metals, Transactions,* v. 47, *Preprint No.* 18, 1954, 16 p.

Tests at room temperature in sodium chloride-potassium chromate solution on a Mg-Al-Zn alloy show effects of heat treatment, grain size, lattice orientation, cathodic protection and pH. Diagrams, graph, photograph, micrographs, tables. 11 ref. (R1, Mg)

454-R. Cathodic Protection Fighting Corrosion Underground. Maurice A. Riordan. *Consulting Engineer,* v. 4, Sept. 1954, p. 58-61.

Components of cathodic protection systems, applications, costs. Diagrams, photographs, graph. (R10)

455-R. (German.) **Corrosion-Retarding Effect of Red Lead Cyanamide.** Hans-J. Schuster and J. D'Ans. *Naturwissensohaften,* v. 41, no. 16, Aug. 1954, p. 373.

Electrical measurements made to determine possible electrochemical reasons for above effect. (R10, R11)

456-R. (German.) **Special Steels for Use in the Construction of High-Pressure Plant in the Chemical Industry.**

Immanuel Class. *Werkstoffe und Korrosion,* v. 5, nos. 8-9, Aug.-Sept. 1954, p. 281-285.

Corrosion and mechanical properties of steel commonly used in corrosive atmospheres and high temperatures. Tables. 21 ref.
(R general, Q general, T26, ST)

457-R. Aluminium Roofing in Severe Conditions of Service. *Petroleum Times,* v. 58, Sept. 17, 1954, p. 959-961.

Case histories of atmospheric corrosion in the petroleum industry. Aluminum roofing is successfully withstanding conditions that would have brought about the rapid failure of more conventional materials. Graphs, photograph. (R3, T26, Al)

458-R. (Book.) **Petroleum Microbiology.** Ernest Beerstecher, Jr. 375 p. 1954. Elsevier Press, Inc., 402 Lovett Blvd., Houston 6, Tex.

Role of micro-organisms in geological processes, petroleum synthesis and utilization, and corrosion; activity in drilling muds and petroliferous formations; effects of hydrocarbons on micro-organisms. (R1)

459-R. Corrosion in Chemical Plant. T. K. Ross. *Chemical Age,* v. 71, Sept. 25, 1954, p. 655-659.

Attack by acid solutions, film growth. Electric potential of metal surfaces. (R6)

460-R. Control of Stress-Corrosion Cracking in Airframe Components. R. N. Hooker and J. L. Waisman. *Corrosion,* v. 10, Oct. 1954, p. 325-334.

Magnitude and orientation of stresses conducive to failures of structural members. Test data on effectiveness of various coatings in preventing cracking. Photographs, micrographs, graphs, diagrams. 2 ref. (R1, Al)

461-R. Electrical Measurements Applied to Corrosion Investigations. William R. Schneider and David Hendrickson. *Corrosion,* v. 10, Oct. 1954, p. 337-342.

Methods of locating anodic areas on wrapped or coated pipe lines. Diagrams, graphs, photographs. 8 ref. (R11, CN)

462-R. Radiometric Study of the Adsorption Characteristics of a Calcium Sulfonate Rust Inhibitor. Van Hong, Stanley L. Eisler, David Bootzin and Alex Harrison. *Corrosion,* v. 10, Oct. 1954, p. 343-348.

Radioactive calcium shows adsorption is effected by chemisorption rather than by simple physical forces. Tables, graphs. 16 ref. (R10, P13, ST)

463-R. Corrosion Prevention by Spray Packaging. D. W. Harbour. *Corrosion Prevention and Control,* v. 1, July 1954, p. 288-291, 295.

Materials and techniques for "sealed envelope" and "strippable film" packaging. Photographs. (R10, L26)

464-R. Fretting Corrosion. I-II. K. H. R. Wright. *Corrosion Prevention and Control,* v. 1, Sept. 1954, p. 405-410, 447; Oct. 1954, p. 465-471, 484.

Characteristics and mechanism, effects of humidity variations and preventive measures. Photographs, micrographs, graphs. (R1)

465-R. Corrosion of Pipes by Bacteria. L. T. Minchin. *Gas Age,* v. 114, Oct. 7, 1954, p. 45-47, 101-102.

European survey of microbiological anaerobic corrosion with special reference to experience in Low Countries. Table, photographs. 7 ref. (R1, CN)

466-R. CHC. Vapour-Phase Corrosion Inhibitor. *Machinery (London),* v. 85, Sept. 17, 1954, p. 630-634.

Nature, properties, action and use of cyclohexylamine carbonate, effect on metals and evaluation of vapor-phase corrosion inhibitors. Tables, photographs. (R10)

467-R. Corrosion Control by Anodic Protection. C. Edeleanu. *Metallurgia,* v. 50, no. 299, Sept. 1954, p. 113-116.

Although applicable only under special conditions, the process can give spectacular results such as protection of stainless steel in boiling sulfuric acid. Graphs, table, diagram, photograph. 4 ref. (R6, R10, SS)

468-R. The Oxidation of Iron at 175 to 350° C. D. E. Davies, U. R. Evans and J. N. Agar. *Royal Society, Proceedings,* v. 225, ser. A, Sept. 22, 1954, p. 443-462.

Oxidation of iron, previously freed from oxide by hydrogen treatment, was studied at 175 to 350° C. Five methods (gravimetric, electrometric, film transfer followed by chemical or microscopic examination, X-rays and electron diffraction) used to identify and estimate oxides. Diagrams, tables, graphs. 65 ref. (R2, Fe)

469-R. Corrosion of Zirconium in High-Temperature Water. D. E. Thomas. Paper from "Nuclear Engineering". American Institute of Chemical Engineers, p. 16-22.

Kinetics of the corrosion reaction and the effects of impurities, surface preparation, mechanical deformation, metallurgical structure and water purity. Graphs, tables. (R4, Zr)

470-R. Corrosion of Metals. S. C. Britton. Paper from "Reports on the Progress of Applied Chemistry". Society of Chemical Industry, p. 232-242.

Surveys developments in Great Britain. High temperature, atmosperic, soil, water microbiological and stress corrosion. 134 ref. (R general)

471-R. (English.) **The Influence of Anodic Oxide Films on the Thermal Oxidation of Zirconium.** J. J. Polling and A. Charlesby. *Acta Metallurgica,* v. 2, no. 5, Sept. 1954, p. 667-674.

Electrolytic and thermal oxide layers have same effect on continued thermal oxidation. Relation of oxidation rate to temperature. Graphs, tables. 13 ref. (R2, Zr)

472-R. (German.) **Damage to a Lead Cable Sheath by the Larvae of the Goat-Moth Caterpillar.** Kurt Lapkamp and Ludwig Körner. *FTZ; Fernmeldetechnische Zeitschrift,* v. 7, no. 9, Sept. 1954, p. 465-467.

Biological habits, large and strong mandibles enable it to gnaw through lead plates. Photographs. (R1, Pb)

473-R. (German.) **Passivation Phenomena on Nickel.** Karl Hauffee and Irmtraud Pfeiffer. *Zeitschrift für Metallkunde,* v. 45, no. 9, Sept. 1954, p. 554-562.

Review of literature and experimental study of electrochemical behavior of thermally produced nickel oxide films, their passivation effects and effect of bromine ions on passivation. Diagrams, graphs. 41 ref. (R10, Ni)

474-R. Corrosive Conditions Encountered by Edge Cutlery. C. M. Kington. *Corrosion Technology,* v. 1, Sept. 1954, p. 226-228.

Typical cases of corrosion of knives, scissors and razors and means for their protection in shipping and storage. Photographs. (R general, CN, SS)

475-R. Cathodic Protection in the Marine Field. W. Godfrey Waite. *Corrosion Technology,* v. 1, Sept. 1954, p. 229-232.

Protection of hulls, propellers, stern gear, cargo compartments, floating docks and mooring buoys. Diagram. 5 ref. (R10, CN, CI, Cu, Al)

476-R. Corrosion and Deposit in Gas Turbines. B. O. Buckland. *Industrial and Engineering Chemistry,* v. 46, Oct. 1954, p. 2163-2166.

Methods developed for inhibiting the corrosive effects of sodium and vanadium in ash constituents and the problems involved in using residual fuels. Graphs, table, diagram. 3 ref. (R10, R7)

477-R. (German.) **Evaluation of the Effectiveness of "Premium" Additives on the Basis of Laboratory-Corrosion Tests With Hot Automobile Oils.** A. Bukowiecki. *Schweizer Archiv für angewandte Wissenschaft und Technik,* v. 20, no. 8, Aug. 1954, p. 255-263.

Tests of regular and premium motor oils to determine their corrosive effects on lead, copper and iron as functions of accessibility of air, viscosity and type of additive. Photographs, micrographs, graphs. 19 ref. (R7, Pb, Cu, Fe)

478-R. (German.) **Protection Against Corrosion by Means of Cast Magnesium Anodes.** K. Sautner. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 28, Oct. 1, 1954, p. 951-954.

Explains protecting effect of magnesium on iron and shows it can be used successfully in marine equipment. Tables, diagrams, graph, photographs. 12 ref. (R10, Mg, St)

479-R. (Russian.) **Determination of Two Basic Parameters of Long Subterranean Metallic Structures.** B. G. Lortkipanidze. *Elektrichestvo,* 1954, no. 9, Sept., p. 64-65.

Equations for damping coefficient and effective resistance for calculating cathodic protection. Graphs. 3 ref. (R10, Q8)

480-R. Corrosion Control in Industrial and Steam Power Plants. Ralph M. Lemen. *Combustion,* v. 26, Oct. 1954, p. 38-44.

Entire range of possible corrosion problems with suggested solutions and analysis of applicability and limitations of preventive equipment. Diagrams, photographs, tables, graph, micrograph. (R general)

481-R. The Corrosion Section of the British Non-Ferrous Metals Research Association. P. T. Gilbert *Corrosion Technology,* v. 1, Oct. 1954, p. 276-279.

Facilities available and current work. Photographs. (R general, A9)

482-R. Electrical Techniques for Combating Underground Corrosion by Stray Electric Current. G. Mole. *Corrosion Technology,* v. 1, Oct. 1954, p. 280-285.

Review of techniques for location and control of underground corrosion. Diagrams, graphs. 17 ref. (R8, R10)

483-R. Corrosion Inhibitors. II. Inhibitors in Practice. L. L. Shreir. *Corrosion Technology,* v. 1, Oct. 1954, p. 291-294.

Factors influencing choice of inhibitor, characteristics of common inhibitors and water treatment. Photographs. 44 ref. (R10)

484-R. Protective Coatings—First Line of Defense Against Corrosion. Paul O. Blackmore. *Interchemical Review,* v.13, Autumn 1954, p. 75-84.

Corrosion theory and control. Photographs, diagrams, table. (R1, L general)

485-R. Motion Pictures as Corrosion Research Aid. F. H. Beck and M. G. Fontana. *Ohio State University. Engineering Experiment Station, News in Engineering,* v. 26, Nov. 1954, p. 3-7.

Equipment and procedures for recording stress-corrosion process on motion picture film. Diagrams, micrographs. 83 ref. (R1, R11, Mg)

486-R. How to Save Steel Tanks. Harry J. Keeling. *Pipe Line Industry,* v. 1, Sept. 1954, p. 68, 70, 73.

Corrosion virtually eliminated by insulating metal surface with application of protective coating to tank surface, or by applying cathodic protection current to surface of submerged metal. Photographs, diagram. (R10, ST)

487-R. The Protection of Aircraft Piston Engines Against Corrosion During Storage. D. Golothan. *Shell Aviation News,* 1954, no. 195, Sept., p. 19-22.

External and internal use of protective compounds. Laboratory testing of preservative oils. Photographs. (R10, L26)

488-R. (Dutch.) **Corrosion-Resistant Materials.** T. van der Klis. *Bedrijf en Techniek,* v. 9, no. 211, Sept. 25, 1954, p. 447, 449, 451, 453.

Classification of materials by resistance to specific corrosive agents, and temperature. (R general, SG-g)

489-R. (Dutch.) **Corrosion Tests on Welded Austenitic Stainless Steel.** A. Ph. Krijff and A. De Visser. *Smit Mededelingen,* v. 9, no. 3, July-Sept. 1954, p. 79-87.

Influence of plate material properties and plate thickness on test results. (R11, SS)

490-R. (French.) **Influence of the Crystalline Orientation of Iron on the Formation of Oxide Nuclei at Its Surface at Low Oxygen Pressures and High Temperatures.** Jean Bardolle and Jacques Benard. *Comptes rendus,* v. 239, no. 12, Sept. 20, 1954, p. 706-709.

Quantitative study on oxidation mechanism. Diagram, micrographs. 4 ref. (R2, Fe)

491-R. (French.) **Corrosion of Castings and New Concept of Balanced pH (pHp).** Albert Levasseur. *Fonderie,* 1954, no. 103, Aug., p. 4096-4098.

Modified concept relating acid-base concentrations and normal pH values. 8 ref. (R1)

492-R. (German.) **Behavior of Different Sorts of Commercial Iron in Different Acids.** Anton Königer. *Giesserei,* v. 41, no. 20, Sept. 30, 1954, p. 522-527.

Potentials of different cast irons and unalloyed steel in different concentrations of nitric acid show that gray iron can be passivated by up to 19.1% nitric acid concentrations. Diagrams, graphs. (R6, CI, CN)

493-R. (Norwegian.) **Corrosion.** B. S. Elset. *Teknisk Ukeblad,* v. 101, no. 35, Sept. 30, 1954, p. 765-767.

Various types of corrosion. Classification of metals and alloys on the basis of electrochemical potentials. (R general)

494-R. (Russian.) **Influence of Some Inhibitors on the Rate of Solution of Carbon Steel in Nitric Acid.** S. A. Balezin and G. S. Parfenov. *Zhurnal Prikladnoi Khimii,* v. 27, no. 9, Sept. 1954, p. 930-938.

Relates solution rate and iron electrode potential to acid concentration, temperature and mixing. Diagram, tables, graphs. 27 ref. (R10, CN)

495-R. (Russian.) **Corrosion of Iron in Fused-Salt Mixtures.** V. P. Kochergin, A. V. Kabirov, and O. N. Skorniakova. *Zhurnal Prikladnoi Khimii,* v. 27, no. 9, Sept, 1954, p. 945-952.

Time and temperature relations in aqueous and dehydrated carnallites. Tables, graphs. 12 ref. (R5, R6)

496-R. (Russian.) **Corrosion of Metals in Chlorine at Elevated Temperatures.** Kh. L. Tseitlin. *Zhurnal Prikladnoi Khimii,* v. 27, no. 9, Sept. 1954, p. 953-958.

Apparatus used from 260 to 300° C. Table, graphs, diagrams. 9 ref. (R5, Al, CN, Cu, Ni)

SECTION S

INSPECTION and CONTROL

1-S. Cost Reduction Through Electronic Production Control. R. G. Canning. *Mechanical Engineering,* v. 75, Nov. 1953, p. 887-890.

Possibility of using an electronic system to take over many routine clerical operations and assist in nonroutine operations. Diagrams. 3 ref. (S18)

2-S. An Electronic Thickness Gage. Abner Brenner and Jean Garcia-Rivera. *Plating,* v. 40, Nov. 1953, p. 1238-1243; disc., p. 1244.

Design, operation and applications of instrument for measuring thickness of coatings on metals provided the conductivities of coating and basis metal differ sufficiently. Graphs, diagrams, photographs. 6 ref. (S14)

3-S. Thickness of Electrodeposited Coatings by the Anodic Solution Method. C. F. Waite. *Plating,* v. 40, Nov. 1953, p. 1245-1248; disc., p. 1253-1254.

Technique and applications. Advantages in certain instances over drop test or magnetic methods. Diagrams, table. (S14, L17)

4-S. Testing Organic Finishes and Interpretation of Results. C. O. Hutchinson. *Plating,* v. 40, Nov. 1953, p. 1255-1266; dis., p. 1266-1268.

Over 60 properties of organic finishing materials as a basis for evaluating coatings. Lists standard tests for most of these properties. Tables. 141 ref. (S22)

5-S. Utility of Isotopes in Metallurgy. Henry C. Boynton and A. D. Kirshenbaum. *Steel,* v. 133, Nov. 9, 1953, p. 130-133.

Tracer elements were found to be valuable shortcut in quantitative analysis of oxygen in such metals as iron, steel and copper. Diagrams, tables. (S19, S11, CI, ST, Cu)

6-S. Product Specifications. Magnesium Alloys. *Welding Engineer,* v. 38, Nov. 1953, p. 51.

Data sheet presents cross references to various manufactures, federal and society specifications. (S22, Mg)

7-S. (French.) **Statistical Control. Some Methods Applicable to Welded Construction.** G. d'Herbemont. *Soudure et Techniques connexes,* v. 7, no. 9-10, Sept.-Oct. 1953, p. 242-250.

Three groups of methods for determining causes of quality variation. Proposes plan and analysis of variance capable of serving as a basis for tests on quality of weldments. Tables, graphs. (S12, K general)

8-S. The Open-Circuit Thermocouple. Richard D. Potter. *Metal Progress,* v. 64, Nov. 1953, p. 80-81.

Measurement of temperature by spot welding the thermocouple wires to the sample being studied in such a way as to make the specimen a part of the junction of the thermocouple. (S16)

9-S. Ten Practical Uses of Statistical Quality Control in Metallurgical Plants. *Metal Progress,* v. 64, Nov. 1953, p. 82-88.

Uses to obtain quality assurance, customer standards, operator interest and tolerances for machines and methods. Examples of uses in production of articles from aluminum sheet. Photographs, diagrams, quality control form. (S12, Al)

10-S. Statistical Quality Control at Detroit's Ternstedt Division. Bryant W. Pocock. *Products Finishing,* v. 18, Nov. 1953, p. 24-32, 34, 36, 38, 40, 42.

Adoption of quality control and procedure for putting it into practice for pinpointing operations causing defective copper plated products. Photographs, graphs. (S12, L17, Cu)

11-S. Thermocouples for 3400° F. Temperatures. (Digest of "High-Temperature Thermocouples" by H. A.

Wilhelm, H. J. Svec, A. I. Snow and A. H. Danne; *U. S. Atomic Energy Commission Report* AECD-3275.) *Metal Progress,* v. 64, Nov. 1953, p. 134, 136, 138.

Previously abstracted from original. See item 519-S, 1952. (S16)

12-S. Betatron and Isotope Radiography. A. von Arx. *Brown Boveri Review,* v. 40, no. 8, Aug. 1953, p. 289-295.

Limits of application of radioisotopes, X-ray apparatus, and betatrons and their respective advantages and disadvantages. Radiographs, photographs, diagrams. 4 ref. (S19)

13-S. Non-Destructive Testing of Brown Boveri Products by Gamma-Radiography. A. Lüthy. *Brown Boveri Review,* v. 40, no. 8, Aug. 1953, p. 296-304.

Determination and location of internal faults in cast and welded machine parts. Radiographs, photographs. (S13)

14-S. A Method of Metallurgical Microspectroscopy. Ford R. Bryan and Cleo H. Neveu. *Metal Progress,* v. 64, Dec. 1953, p. 82-85.

Techniques, equipment and applications of method for identifying microconstituents of metallurgical specimens. Photographs. (S11, M27)

15-S. Some Applications of Statistical Analysis in the Steel Industry. John W. W. Sullivan. *Metal Progress,* v. 64, Dec., 1953, p. 91-96, 97-98.

Ways in which test and production data can be used to establish controls of product variability. (S12)

16-S. Canadian Plan for Birthmarking Steels. *Steel,* v. 133, Nov. 16, 1953, p. 119, 122.

Cold finished shapes are identified by ink stamping, hot rolled shapes are identified by indentation stamping. Both are supplemented by standard color code prepared for 24 subgroups. (S10, ST)

17-S. Gaging With Activated Neutrons. H. V. Watts and L. Reiffel. *Steel,* v. 133, Nov. 23, 1953, p. 110-111.

Beta-ray gaging of silver plating on radar waveguides. Photographs. (S14, Ag)

18-S. (German.) **Sheet-Metal Thickness Measuring Instruments, Especially for Measuring Thicknesses of Rolled Strip. I. Induction and X-Ray Measuring Instruments.** N. de Ball. *Archiv für technisches Messen,* 1953, no. 213, Oct., p. 219-222.

Diagrams, photographs. (S14)

19-S. (German.) **New Methods of Measuring Temperature in Iron and Steel Industry. I. Measuring Temperature With Thermocouples.** Fritz Lieneweg. *Archiv für technisches Messen,* 1953, no. 213, Oct., p. 231-232.

Use of thermocouples with and without graphic recorders. Photograph, diagram. 39 ref. (S16, ST, Fe)

20-S. (Polish.) **New Structural Steels.** Tadeusz Malkiewicz. *Hutnik,* v. 20, no. 10, Oct. 1953, p. 203-207 + data sheet.

New standards for common carbon steels of ordinary and increased strength. Alloyed structural steels, designation of steels and advantages from introduction of new standards. Tables. (S22, AY)

21-S. (Book.) **American Standard Specifications for Cast Iron Pipe Centrifugally Cast in Metal Molds for Gas.** 20 p. 1953. American Standards Association, 70 East 45th St., New York 17, N. Y.

Definitions, descriptions, quality control, records, marking, inspection, variation tolerances, cleaning and inspecting, testing, exterior coatings, rejection criteria, standard dimensions, thicknesses, diameters, and weights. (S22, T27, E14, CI)

22-S. (Book.) **American Standard Specifications for Cast Iron Pipe Centrifugally Cast in Metal Molds for Water and Other Liquids.** 17 p. 1953. American Water Works Assoication, 521 Fifth Ave., New York 17, N. Y. $0.40.

Definitions, descriptions, casting methods, quality, variation tolerances, cleaning and inspecting, testing, linings, exterior coatings, rejection procedure, standard thicknesses, diameters, and weights. (S22, T27, E14, CI)

23-S. (Book.) **American Standard Specifications for Cast Iron Pipe Centrifugally Cast in Sand-Lined Molds for Gas.** 23 p. 1953. American Standards Association, 70 East 45th St., New York 17, N. Y.

Definitions, descriptions, quality, records, marking, inspection, tolerances of variations, cleaning, weighing, exterior coatings, tests, rejection criteria, standard dimensions, thicknesses, and weights. (S22, T27, E14, CI)

24-S. (Book.) **American Standard Specifications for Cast Iron Pipe Centrifugally Cast in Sand-Lined Molds for Water or Other Liquids.** 22 p. 1953. American Water Works Association, 521 Fifth Ave., New York 17, N. Y. $0.45.

Definitions, descriptions, casting and quality, records, inspection, tolerances of variations, cleaning and inspecting, linings, exterior coatings, tests, rejection criteria, standard dimensions, standard thicknesses, diameters, and weights. (S22, T27, E14, CI)

25-S. (Book.) **American Standard Specifications for Cast Iron Pit Cast Pipe for Gas.** 18 p. 1953. American Standards Association, 70 East 45th St., New York 17, N. Y.

Descriptions, casting practices, quality, records, marking, inspection, weighing, exterior coatings, standard thicknesses, and weights. (S22, T27, E11, CI)

26-S. (Book.) **American Standard Specifications for Cast Iron Pit Cast Pipe for Water or Other Liquids.** 22 p. 1953. American Water Works Association, 521 Fifth Ave., New York 17, N. Y. $0.45.

Complete specifications for quality, inspection procedure, cutting, cleaning, testing, weighing, standard dimensions, thicknesses, and weights. (S22, T27, E11, CI)

27-S. (Book.) **American Standard Specifications for Cement Mortar Linings for Cast Iron Pipe and Fittings.** 5 p. 1953. American Water Works Association, 521 Fifth Ave., New York 17, N. Y. $0.35.

Characteristics of cement, sand, accepted specifications, water, preparation, application, thickness, curing of cement linings, exterior coatings, and testing of bituminous coatings. (S22, L26, CI)

28-S. (Book.) **American Standard Specifications for Short-Body Cast Iron Fittings, 3 Inch to 12 Inch, for 250-PSI Water Pressure Plus Water Hammer.** 8 p. 1953. American Water Works Association, 521 Fifth Ave., New York 17, N. Y. $0.35.

Description, casting, quality, records, marking, inspection, tolerance variations, cleaning and inspecting, weighing, tests and dimensions. (S22, T27, E general, CI)

29-S. (Book.) **1952 Book of ASTM Standards, Including Tentatives. Part I. Ferrous Metals.** 1572 p. **Part 2. Nonferrous Metals.** 1327 p. 1953. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

Contains 500 specifications. Describes methods of testing. (S22, Q general)

30-S. (Book.) **Radioactive Isotopes.** W. J. Whitehouse and J. L. Putman. 424 p. 1953. Clarendon Press, Oxford, England. 50s.

Of interest to the metallurgist are sections on self-diffusion; friction and lubrication; and microradiography. (S19, N1, Q9, M23, EG-h)

31-S. (Book.) **Temperature Measurement in Engineering.** v. 1. H. Dean Baker, E. A. Ryder and N. H. Baker. 179 p., 1953. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $3.75.

Design, performance, and operation of various installations, particularly thermocouple technique. (S16)

32-S. Use of Gamma-Ray Emitters For Industrial Radiography. Herbert R. Isenburger. *American Foundryman,* v. 24, Dec. 1953, p. 46-48.

Properties, uses, testing procedures and safety precautions. Charts, tables. (S19)

33-S. Statistical Quality Control. The Introduction of a Form of Sampling Inspection. L. Griffiths. *Automobile Engineer,* v. 43, Nov. 1953, p. 453-458.

Reviews elementary statistical theory, control charts, control limits, sampling intervals and applications to automatic production. Graphs, tables. 12 ref. (S12)

34-S. The Use or Radioactive Isotopes in Metallurgy. R. Shuttleworth. *British Journal of Applied Physics,* v. 4, Nov. 1953, p. 326-329.

Applications in radiography; gaging thickness of foils and coatings; detecting minute amounts of labelled metals; and measuring self-diffusion coefficients. Tables. 25 ref. (S19)

35-S. Direct-Indicating Recording Instruments. II. S. R. Gilford. *Electrical Manufacturing,* v. 52, Dec. 1953, p. 120-128.

Basic operating principles. Design elements and frequency response of various commercial instruments analyzed, including null-type, moving-coil and photo-electric types with associated pen motors. Graphs, photographs, diagrams, table. 14 ref. (S16, S19)

36-S. Statistical Quality Control. A. J. Kukla. *Foundry,* v. 81, Dec. 1953, p. 120-124, 248-249.

Quality control procedures in sand control and melting and molding operations in foundries. Charts. (S12, E19, E10, Mg)

37-S. ASA Will Simplify Surface Roughness Measurements. F. W. Witzke. *Iron Age,* v. 172, Dec. 3, 1953, p. 180-182.

Use of arithmetic average microinch readings for surface roughness measurements are recommended in a proposed revision of American Standard ASA B.46 1953. Diagram, photographs. (S15)

38-S. Specifications Relating to Aluminium and Magnesium. *Light Metals,* v. 16, Nov. 1953, p. 368-370.

List of revisions to indexes and schedules of the specifications originally published in *Light Metals,* v. 16, 1953, p. 121. (S22, Al, Mg)

39-S. Mechanisms of Sleeve Bearing Failure. P. B. Burgess. *Lubricaton Engineering,* v. 9, Dec. 1953, p. 309-312.

Examination scheme for finding most probable failure mechanisms of damaged bearings. Discusses use of wide angled magnifier and magnetized pick or probe. Photographs. (S13)

40-S. How Form Tolerances Affect Gaging Requirements. III. Earle Buckingham. *Machinery,* v. 60, Dec. 1953, p. 180-185.

How tolerances on form—particularly tapers—are selected and how they determine the gaging requirements. Graphs, diagrams. (S14)

41-S. The Problem of Defining Micro-Geometrical Irregularities of Mechanical Parts. P. Nicolau. *Microtechnic (English Ed.),* v. 7, no. 5, 1953, p. 220-225.

Translated from the French. Attempt to standardize terms used in surface roughness measurement. Graphs, diagrams. (S15)

42-S. (German.) **The Resistometer as a Tester of the Protective Layer on Aluminum and Other Metals.** W. Ruff. *Aluminium,* v. 29, no. 11, Nov. 1953, p. 462-464.

Working principle based on definition of ohmic resistance of film. Graphs, diagrams. (S13, Al)

43-S. (German.) **The Electrolytic Separation of Tin From Its Chlorine Compounds. II. Separation From Tin^{+4} Salt Solutions.** Arnaldo Foschini. *Zeitschrift für analytische Chemie,* v. 139, no. 6, 1953, p. 408-412.

Investigations on uncoated and copper coated Winkler electrodes in presence and absence of ammonium oxalate. Tables. 3 ref. (S11, Sn)

44-S. (German.) **The Effect of Mechanical Stresses During Magnetic Induction Testing for Defects of Steel Pipes.** Kurt Matthaes. *Zeitschrift für Metallkunde,* v. 44, no. 10, Oct. 1953, p. 473-474.

Proposes method for suppressing mechanical stresses during such measurements by use magnetic-mechanical instruments. (S13, Q25, ST)

45-S. Liquid-Metal Sampling Apparatus. *Engineering,* v. 176, Dec. 4, 1953, p. 735.

Apparatus which enables furnace samples of steel or other metals to be produced in finely granulated or divided form directly from liquid state. Diagram. (S12)

46-S. TV for Industry. Norman J. Rivkees and Richard T. Kohler. *Industry and Power,* v. 65, Dec. 1953, p. 60-63.

Overlooking a freight yard or inside a steel furnace, a TV camera can give the operator a "bird's eye" view of what's going on in the plant. Photographs. (S18)

47-S. Cooling Water Commander. P. W. McRaven. *Instrumentation,* v. 7, no. 1, 1953, p. 10-13.

Control panel for continuously indicating oxidation inhibitor concentration, dissolved solids concentration, and pH of recirculated cooling water. Photographs, diagram. (S18, R10)

43-S. Advancing Process Control. C. W. Worley and G. W. McKnight. *Instrumentation,* v. 7, no. 1, 1953; p. 21-28.

System engineering that explains feedback control and one of its techniques, frequency response testing. Graphs, diagrams. (S18)

49-S. Nuclear Reactors for Industry and Research. IV. Radiation Protection. Karl Z. Morgan. *Instruments,* v. 26, Dec. 1953, p. 1872-1874, 1900-1903.

Includes tables, photographs. (S19)

50-S. A Steel-Plate Thickness Meter. S. S. Carlisle and R. B. Sims. *Instruments,* v. 26, Dec. 1953, p. 1880-1881, 1903-1904.

An instrument for measurement of the thickness of steel plates when only one face is accessible uses the total magnetic induction in body of plate at saturation. Development, construction and performance. Graphs, diagrams, photograph. 9 ref. (S14)

51-S. Bore Profilometer. S. S. Carlisle and R. B. Sims. *Instruments,* v. 26, Dec. 1953, p. 1882-1883, 1906.

For accurate measurements of internal profile of small bores, as in wiredrawing dies. Uses probe and optical-reflection technique. Development, features and performance. Diagrams, photographs. 4 ref. (S15)

52-S. Standard Analyses of German Alloy Steels. *Metal Progress,* v. 65, Jan. 1954, p. 96B.

Data sheet indicating chemical compositions and tensile strength of carburizing and constructional steels. (S22, AY)

53-S. Tell-Tale Paints Reveal Temperature Changes. J. E. Cowling. *Research Reviews, Office of Naval Research,* Nov. 1953, p. 1-5.

Research on a series of paints for temperature range 50 to 278° C. Photographs, tables. (S16)

54-S. Sound Waves Uncover Inner Flaws. *Steel,* v. 133, Dec. 14, 1953, p. 120-121.

Ultrasonic method of nondestructive testing particularly suited for inspection of heavy sections. Photographs. (S13)

55-S. New ASA Standards for Cast-Iron Pipe. Panel Discussion. *American Water Works Association. Journal,* v. 45, Dec. 1953, p. 1266-1280.

Includes "Development of A21 Specifications", Thomas H. Wiggin; "Cast-Iron Pipe Tests", J. Thompson Vann; "Manufacturing Considerations". H. W. Stuart; "Consulting Engineer's Viewpoint", Louis R. Howson; and "Manager's Appraisal", Wendell R. LaDue. Tables, photographs. (S22)

56-S. Lighting for Industrial Inspection. R. L. Zahour and M. E. Haskins, Jr. *Consulting Engineer,* v. 2, Dec. 1953, p. 37-41.

Factors in selecting type of lighting. Photographs, diagrams, table. (S general)

57-S. Iron-Constantan Thermocouple Tables. *Industrial Heating,* v. 20, Dec. 1953, p.2382, 2384, 2386, 2388.

New reference tables published by Bureau of Standards. Graph. 4 ref. (S16)

58-S. Standards for Aluminium Casting Alloys. F. H. Smith. *Light Metals,* v. 16, Dec. 1953, p. 398.

Comparison between British and foreign specifications. (To be continued.) (S22, Al)

59-S. Measurement of Turbine Blade Forms. *Machinery (London),* v. 83, Dec. 4, 1953, p. 1118-1123.

Equipment and techniques employed. Photographs, diagrams, table. (S14)

60-S. How the PRR Uses Non-Destructive Testing. *Railway Age,* v. 135, Dec. 28, 1953, p. 48-49, 51.

Includes photographs.
(S13, S14, S15)

61-S. Current Systems of Classifying Tool Steels. George H. Thurston. *Western Machinery and Steel World,* v. 44, Dec. 1953, p. 103-104.

Includes table. (S22, TS)

62-S. (Book.) A.S.T.M. Standards on Metallic Electric Conductors. 262 p. American Society for Testing Materials, 1916 Race St., Philadelphia, Pa. $3.00.

Standards covering copper and its alloys, copper-covered steel, aluminum, and galvanized steel. Includes tests for resistivity, strength, and hardness.
(S22, T1, P15, Q general, Cu, ST, Al)

63-S. (Book.) Engineering Statistics and Quality Control. Irving W. Burr. 442 p. McGraw-Hill Book Co., 300 West 42 St., New York 36, N. Y. $7.00.

Textbook, with emphasis on statistics used in industry. Presents frequency tabulation as a useful tool. Discusses averages and variability with emphasis on those measures which are of greatest use in engineering statistics. Includes normal curve with methods for fitting and testing correctness of fit. (S12)

64-S. Quality Control in the Foundry. James M. Barabee. *American Foundryman,* v. 25, Jan. 1954, p. 50-54.

Present program in one company. Photographs, graphs.
(S12, E general)

65-S. A Common Tolerance System. F. W. M. Lee. *Automobile Engineer,* v. 43, Dec. 1953, p. 560-562.

American, British and Canadian proposals critically examined. Graphs. (S22)

66-S. National Physical Laboratory Interferometer. D. C. Barnes and M. J. Puttock. *Engineer,* v. 196, Dec. 11, 1953, p. 763-766.

An interferometer for routine measurements of length dimension of slip and block gages. Tables, diagrams, photographs. 4 ref. (S14)

67-S. Mobile Engineering Radiographic Unit. *Engineer,* v. 196, Dec. 25, 1953, p. 837-838.

Equipment and operating characteristics. Photographs. (S13)

68-S. Practical Application of the New British Standard System of Limits and Fits. G. J. Pearmain. *Engineer,* v. 196, Dec. 25, 1953, p. 848-852.

Abstracted from paper presented at British Inst. of Mech. Engr., Dec. 1953 Means by which new system can be most efficiently applied in industry. Graphs, table, diagram. (S22)

69-S. New Ultrasonic Testing Method. Thomas A. Dickinson. *Foundry Trade Journal,* v. 95, Dec. 17, 1953, p. 763-765.

Apparatus and techniques. Compares method with others in use. Diagram, photographs. (S13)

70-S. Cobalt 60—Inspection Uses Are Growing. D. E. Brewer. *Iron Age,* v. 172, Dec. 31, 1953, p. 80-82.

Cobalt 60 inspection being used to detect flaws in casting and weldments subject to severe stresses, locates hidden elements in internal assemblies and uncovers internal holes and voids. Photograph, radiographs. (S13, S19, Co)

71-S. The Tungsten-Molybdenum Thermocouple for Immersion Pyrometry. I. The Characteristics of the Tungsten-Molybdenum Thermo-

couple. J. P. Simons. **II. The Tungsten-Molybdenum Immersion Pyrometer.** C. G. Hamstead and E. J. Burton. *Iron and Steel Institute, Journal,* v. 175, Dec. 1953, p. 402-407.

Laboratory and works studies have been made of possibility of using tungsten-molybdenum thermocouple for measuring temperature of liquid steel. Diagrams, graphs, table. 21 ref. (S16, W, Mo)

72-S. Hydraulic Load Cells. *Mechanical World and Engineering Record,* v. 133, Dec. 1953, p. 534-536.

Compact and relatively simple method of measuring loads from a few pounds to 500 tons or more. Diagrams. (S general, Q general)

73-S. Effects of Source and Specimen Dimensions on Resolution in Gamma Radiography. A. J. Stevens. *Nondestructive Testing,* v. 11, Nov.-Dec. 1953, p. 13-15.

A general quadratic equation which expresses dispersion to be expected from a gamma source in terms of geometry of exposure setup. Curve relates specimen dimensions to source-film distance for a "standard" source. Diagram, graph, tables. (S13)

74-S. A Technique for Gamma Ray Exposure Determination. Charles E. Juran. *Nondestructive Testing,* v. 11, Nov.-Dec. 1953, p. 25-26.

Simple, rapid method which allows visual comparison of physical arrangements of apparatus. Graphs. (S13)

75-S. Ultrasonic Inspection Using Automatic Recording and Frequency Modulated Flaw Detector. Donald C. Erdman. *Nondestructive Testing,* v. 11, Nov.-Dec. 1953, p. 27-31.

Requirements for complete description of internal flaws, including depth to the flaw and its area. Diagrams, photographs. (S13)

76-S. Some Experimental Findings and Operating Practices in Betatron Radiography. Norman C. Miller and John D. Steely. *Nondestructive Testing,* v. 11, Nov.-Dec. 1953, p. 35-40.

Results of experience and experimentation at one betatron installation including typical applications. Table, photographs, diagrams, graphs. 7 ref. (S13)

77-S. Acceptance Sampling of Electroplated Articles. J. M. Cameron and Fielding Ogburn. *Plating,* v. 41, Jan. 1954, p. 43-46.

Basic ideas behind acceptance sampling procedures which have found widespread usage in governmental and industrial purchasing. Graphs. 3 ref. (S12)

78-S. An Ultrasonic Apparatus for Non-Destructive Testing of Materials. J. Krautkrämer, H. Krautkrämer and O. Rüdiger, Henry Brutcher, Altadena, Cal., Translation no. 2879, 10 p. + 1 plate. (From *Archiv für das Eisenhüttenwesen,* v. 20, nos. 11-12, 1949, p. 355-358.)

Previously abstracted from original. See item 70-S, 1950. (S13)

79-S. Measurement of Metal Thicknesses of Up to About $\frac{25}{64}$ Inch With X-Rays and Geiger Counter. H. W. Fritze. Henry Brutcher, Altadena, Cal., Translation no. 3058, 5 p. + 1 plate. (From *Stahl und Eisen,* v. 72, no. 16, 1952, p. 943-945.)

Previously abstracted from original. See item 442-S, 1952. (S14)

80-S. Measurement of Thicknesses Below One Millimeter (0.04") With Beta Rays. A. Trost. Henry Brutcher, Altadena, Cal., Translation no. 3057, 8 p. + 1 plate. (From *Stahl und Eisen,* v. 72, no. 16, 1952, p. 941-943.)

Previously abstracted from original. See item 442-S, 1952. (S14)

81-S. Measuring the Thickness of Non-Magnetic Layers on Non-Magnetic Basis Materials With Beta Rays and Counting Tube. R. Berthold. Henry Brutcher, Altadena, Cal., Translation no. 3060, 8 p. + 1 plate. (From *Stahl und Eisen,* v. 72, no. 16, 1952, p. 945-947.)

Previously abstracted from original. See item 442-S, 1952. (S14)

82-S. Nondestructive Ultrasonic Testing by the Pulse-Echo Technique. A. Lutsch. Henry Brutcher, Altadena, Cal., Translation no. 3070, 18 p. + 1 plate. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 1-2, 1952, p. 57-65.)

Previously abstracted from original. See item 181-S, 1952. (S13, M23)

83-S. Determination of Gases in Ferrous Metals. Communication I: Redesign of Apparatus for Vacuum-Fusion Method. Yu. A. Klyachko, A. G. Atlasov and E. M. Chistyakova. Henry Brutcher, Altadena, Cal., Translation no. 3103, 15 p. + 1 plate. (From *Zavodskaya Laboratoriya,* v. 16, no. 1, 1950, p. 17-23.)

Application of vacuum-fusion method for determination of total quantity of hydrogen, oxygen, and nitrogen present in iron and steel. Tables, diagrams. 9 ref. (S11, Fe, ST)

84-S. (French.) **Installation of a Source of 30° C. of Radiocobalt Intended for Radiochemical Research.** A. Chapiro, M. Cottin, M. Haissinsky, M. Magat and C. Vermeil. *Journal de physique et le radium,* v. 14, no. 12, Dec. 1953, p. 687-689.

Installation of Co^{60}, transporting and placing of source in the installation and protection apparatus necessary for its use in radio-chemistry. Diagrams. (S19, Co)

85-S. (German.) **An Interference-Optical Instrument for Measuring Thickness of Thin Metal Films.** M. Dühmke and K.-G. Georgi. *Metall,* v. 7, nos. 23-24, Dec. 1953, p. 1000-1002.

Design and use of instrument. Diagrams, photographs. 4 ref. (S14)

86-S. (German.) **Evaluating Technical X and Gamma-Ray Recordings in the Technique of Measuring.** E. A. W. Müller. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 95, no. 32, Nov. 11, 1953, p. 1093-1097.

Proper selection of probes for controlling quality of recordings. Different influences on photographic recordings. Tables, graphs. 9 ref. (S14, Al, ST)

87-S. (German.) **Application of Statistical Procedures to the Problem of Materials Technology.** Hans Bühler and W. Schreiber., *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 95, no. 33, Nov. 21, 1953, p. 1119-1124.

Shows that statistical methods can be applied to fatigue testing and to determine service life of metal molds. Tables, graphs. 15 ref. (S12, Q7, S21)

88-S. (German.) **Nondestructive Electronic Sorting of Metals by Their Physical Properties.** H. H. Rust. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 95, no. 34, Dec. 1, 1953, p. 1158-1159.

Process based on electrical conductivity and permeability of materials. Graphs, microphotographs. 2 ref. (S10)

89-S. (Russian.) **Testing of Application of Statistical Methods in Analysis and Control of Foundry Production.** A. I. Antonov, P. I. Kantor and M. S. Mirkin. *Liteinoe Proizvodstvo,* 1953, no. 8, Aug., p. 20-24.

Method assisted in administration and reduced spoilage. Diagram, graphs, tables. 2 ref. (S12, E general)

90-S. **NBS Has Program of Research and Development in Basic Instrumentation.** *Industrial Gas,* v. 32, Jan. 1954, p. 8-9, 23-24.

Surveys of available instruments and techniques; projects for evaluation of new applications to general and specific problems; and specialized projects. Photographs. 8 ref. (S16, S18)

91-S. **Pneumatic Gauging Applied to the Measurement of the Bore of Tube.** R. Chittleburgh, E. F. Powell, and G. F. Morton. *Journal of Scientific Instruments,* v. 31, Jan. 1954, p. 20-22.

Method using a steel ball in a tube held by an electromagnet. Diagrams. 4 ref. (S14)

92-S. **How Form Tolerances Affect Gaging Requirements. IV.** Earle Buckingham. *Machinery,* v. 60, Jan. 1954, p. 184-190.

How tolerances on form, particularly tapers, are selected and how they determine gaging requirements. Diagrams. (S14)

93-S. **The Best Performance From Beta Gages.** L. R. Zumwalt. *Nucleonics,* v. 12, Jan. 1954, p. 55-58.

Thickness measurements by transmission or reflection. 6 ref. (S14)

94-S. **What's New in Nondestructive Testing.** S. A. Wenk. *Steel,* v. 134, Jan. 18, 1954, p. 78-81.

Wide variety of equipment is available to meet diverse needs of industry. Where possible, inspection and testing are being put right into production line. Photographs, diagram. (S13)

95-S. **Know Your A, B, C's of Government Specifications.** Allen G. Gray. *Steel,* v. 134, Jan. 18, 1954, p. 100-103.

Simplification of system. Tables, photograph. (S22)

96-S. **The Non-Destructive Testing of Wire by Means of Ultrasonics.** Reimar Pohlman. *Draht (English Ed.),* 1953, no. 17, Dec., p. 24-26.

Apparatus, techniques, and applications of test method. Graph, diagrams, photographs. 1 ref. (S13)

97-S. (French.) **Methods for the Preparation and Analysis of Samples of Very High Purity Iron.** J. Talbot, Albert M. Caron and G. Chaudron. *Revue de métallurgie,* v. 50, no. 12, Dec. 1953, p. 817-826; disc., p. 827-828.

Nonmetallic impurities were determined by micro-analysis. Metallic impurities were determined by irradiation. Properties of high-purity iron were studied. Micrograph, diagram, tables, graph, photographs. 8 ref. (S11, M21, Fe)

98-S. (German.) **Status of Measuring Temperature by Immersion in Foundries.** Kurt Guthmann. *Stahl und Eisen,* v. 73, no. 26, Dec. 17, 1953, p. 1693-1703; disc., p. 1703-1705.

Reviews published reports and research results on optical immersion pyrometers, immersion thermocouples, and methods of measuring temperature of melts. Diagrams, photographs, tables, graphs. 141 ref. (S16, E10)

99-S. (German.) **Ultrasonic Testing of Round Steel Bars for Internal Defects.** Heinz Günther Brandt. *Stahl und Eisen*, v. 73, no. 26, Dec. 17, 1953, p. 1717-1720.

Tests were made on 30 to 90-mm. bars of high speed toolsteel by the impulse-echo process. Results were satisfactory for bars over 40 mm. in size. Diagrams, graphs, table. (S13, TS)

100-S. (German.) **Sampling Aluminum and Copper Alloys.** August Buckeley. *Zeitschrift für Erzbergbau und Metallhüttenwesen*, v. 6, no. 12, Dec. 1953, p. 473-477.

Differences in composition due to segregation in liquid state or during freezing process. Proper procedure for sampling. Diagrams, graphs. 9 ref. (S12, C5, Cu, Al)

101-S. Radiographic Characteristics of High-Energy X-Rays. A. L. Pace. *Foundry*, v. 82, Feb. 1954, p. 109-111, 178.

Application of high-voltage radiography results in considerable savings in salvage and repair of heavy cast parts. Photograph, radiographs, graphs. (S13)

102-S. Standards for Aluminium Casting Alloys. F. H. Smith. *Light Metals*, v. 17, Jan. 1954, p. 17-20.

Compares British and foreign specifications and chemical composition of various aluminum alloys. Tables. (To be continued.) (S22, Al)

103-S. Determining Weight Electronically. Verne C. Kennedy. *Mechanical Engineering*, v. 76, Feb. 1954, p. 159-165.

Three basic elements, load cells, servosystem and data-presentation device. Photographs, diagrams. (S general)

104-S. A New Method of Analyzing Extreme-Value Data. Julius Lieblein. *U. S. National Advisory Committee for Aeronautics, Technical Note*, 3053, Jan. 1954, 88 p.

Method of application. Techniques provide simple means for estimating necessary parameters, making predictions from fitted curve, estimating reliability and evaluating efficiency of the method. Graphs, tables. 21 ref. (S12)

105-S. (French.) **Application of Supersonics for the Inspection of Welds.** G. A. Homes and J. van Leemput. *Revue de la Soudure (Brussels)*, v. 9, no. 4, 1953, p. 214-225.

Methods and apparatus. Use of supersonics to detect suspected areas for subsequent X-ray photography. Photographs, graphs, diagram. (S13, K9)

106-S. (Book.) **Industrial Specifications.** E. H. Mac Niece. 158 p. 1953. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16. $4.50.

Need for better specifications plus other associated topics. (S22)

107-S. (Book.) **Select Methods of Metallurgical Analysis.** W. A. Naish, J. E. Clennell, and V. S. Kingswood. 2nd Ed. 1953. Chapman & Hall, Ltd., 37-39 Essex St., London, W.C.2, England. £3-5-0.

Designed for metallurgical chemists and advanced students. (S11)

108-S. (Book.) **The Tool Steel Trouble Shooter.** Bethlehem Steel Co., Bethlehem, Pa.

A practical handbook to help identify and correct most frequent causes of tool and die failures. (S21, TS)

109-S. Controlling Metal Quality at Ford's Cleveland Foundry. *Metal Progress*, v. 65, Feb. 1954, p. 87-89.

Use of the spectrometer. General foundry operations. Photographs. (S11, E general)

110-S. (German.) **New Applications of the Similarity Principle.** F. Schultz-Grunow. *Chemie-Ingenieur-Technik*, v. 26, no. 1, Jan. 1954, p. 18-24.

Applications to theory of flame propagation, rheological liquids, flow of molten glass, flow of liquid steel in the converter, effect of pulsating flow on coal dust combustion and fuel gas flow during corner burning. Graphs, tables, photographs, diagrams. 13 ref. (S18, ST)

111-S. (German.) **Measuring Wall Thickness of Steel Flasks in Production.** Franz Bollenrath and Viktor Hauk. *Archiv für das Eisenhüttenwesen*, v. 24, nos. 11-12, Nov.-Dec. 1953, p. 515-518.

Continuous method of measuring thickness with X-rays. Counting tube. Photographs, diagrams, graphs. 14 ref. (S14, ST)

112-S. (German.) **Theory and Practice of Materials Testing With Ultrasound.** H. J. Seemann and W. Bentz. *Metall*, v. 8, nos. 1-2, Jan. 1954, p. 1-11.

Effect of structure on extinction of elastic waves. Equipment, methods and practical uses. Diagrams, oscillograms, photograph. 25 ref. (S13)

113-S. (German.) **The Permeability of Steel to Ultrasound and Its Significance to Results of Impulse-Echo Testing Process.** Alfred Michalski. *Stahl und Eisen*, v. 74, no. 1, Jan. 1, 1954, p. 26-33.

Importance of distinguishing between real and pseudo obstructions.

Various causes of poor ultrasound transmission. Micrographs, photographs, diagram, graphs. (S13)

114-S. (German.) **Experiences With Immersion Thermocouples.** Gerhard Eichert. *Stahl und Eisen,* v. 74, no. 2, Jan. 14, 1954, p. 95-98.

Surveys laboratory and plant experiences with operation between 1000 and 1700° C. Comparative temperature measurements of alloyed and unalloyed steel melts made with immersion thermocouple and color pyrometer. Diagrams, graphs, photographs. (S16, CN, AY)

115-S. **Accuracy Limitations of Beta-Ray Thickness Measurement.** L. Mandel. *British Journal of Applied Physics,* v. 5, Feb. 1954, p. 58-64.

Output fluctuations of beta-ray thickness gages and limitations they impose on accuracy of measurement. Graphs, diagrams. (S14)

116-S. **Standards for Aluminium Casting Alloys.** F. H. Smith. *Light Metals,* v. 17, Feb. 1954, p. 51-54.

Compares British and other specifications for quantities of composition elements. (To be continued.) (S22, Al)

117-S. **Non-Destructive Testing.** R. H. Warring. *Machinery Lloyd (Overseas Ed.),* v. 26, Jan. 30, 1954, p. 71-74.

Various methods and applications. Tables, diagrams. (S13, S14, S15)

118-S. **Conforming Specifications for Cast Copper Base Alloys.** *Materials & Methods,* v. 39, Feb. 1954, p. 137, 139.

Data sheet. Cross references specifications for various copper alloys. (S22, Cu)

119-S. **Internal Microstrains and the Deformation and Failure of Metals.** L. J. Dijkstra, U. Martius, B. Chalmers and P. E. Cavanagh. *Nondestructive Testing,* v. 12, Jan.-Feb. 1954, p. 13-18.

Usefulness of magnetic methods in estimating and measuring, by nondestructive methods, engineering service to be expected from steels. Micrographs, photograph, diagram. 3 ref. (S13, ST)

120-S. **The Use of Artificially Produced Radioisotopes in Industrial Radiography.** W. A. McCarthy. *Nondestructive Testing,* v. 12, Jan.-Feb. 1954, p. 19-20.

Comparison between cost, use and effects of isotopes, and radium and X-rays. 8 ref. (S13, S14, S15)

121-S. **An Investigation of the Application of Iridium 192 Gamma Radiation to the Radiography of Light Metal Castings.** Robert V. Wolf and Karl P. W. Wolf. *Nondestructive Testing,* v. 12, Jan.-Feb. 1954, p. 26-29.

An exposure chart for aluminum. Indications of penetrameter sensitivities for sections. Radiographs, graphs, tables. 9 ref. (S13, Al)

122-S. **Ten Years' Cooperation Between the Society for Nondestructive Testing and the American Society for Metals.** C. G. Lutts. *Nondestructive Testing,* v. 12, Jan.-Feb. 1954, p. 31-36.

History and early experiments in radiography. (S general, A2)

123-S. **X-Ray Focal Spot Measurement.** D. Polansky and D. T. O'Connor. *Nondestructive Testing,* v. 12, Jan.-Feb. 1954, p. 37-40.

Finite size of X-ray focal spot is critical factor in both radiography and fluoroscopy. Modern techniques place a greater emphasis on reduced focal spot size. Photographs, tables. 5 ref. (S13)

124-S. **How to Chase a Pig Through a Pipe.** Frank Chapman. *Nondestructive Testing,* v. 12, Jan.-Feb. 1954, p. 41-44.

Newly developed sonic listening device which logs progress of the pig through the line; and a Geiger counter, operating on radioactive radiation, to locate a stalled pig. Diagrams, photograph. (S19)

125-S. **Spectroscopy of the Solid State: Some of the Transition Elements.** E. M. Gyorgy and G. G. Harvey. *Physical Review,* v. 93, ser. 2, Feb. 1, 1954, p. 365-369.

Three *P* emission curves of nickel, manganese and iron have been obtained by using a vacuum-recording spectrograph. A plausible interpretation of a number of features of experimental bands. Diagrams, tables, oscillograms. 12 ref. (S11, Ni, Mn, Fe)

126-S. **Carbide Tool Evaluation.** H. O. Warnock. *Tooling and Production,* v. 19, Feb. 1954, p. 45-47, 169.

Tool evaluation as a quality control for the consumer and a process control for the manufacturer. Photographs, graphs. (S12, S18, SG-j)

127-S. **How Quality Can Make or Break Carbide Tools.** Alfred D. Stevens. *Tooling and Production,* v. 19, Feb. 1954, p. 52-55.

Usable life of a cemented carbide tool is dependent on proper application of its basic characteristics. Photographs, micrographs. (S12, S18, SG-j)

128-S. (Dutch.) **Copper and Copper Alloys. XIII. Brass.** W. G. R. De

Jager. *Metalen,* v. 8, no. 21, Nov. 15, 1953, p. 390-392; v. 8, no. 23, Dec. 15, 1953, p. 426-427.

Composition of standard brasses of Germany, Great Britain and the U.S.A. Tables. (To be continued.) (S22, Cu)

129-S. (German.) **Sheet-Metal Thickness-Measuring Instrument Especially for Measuring During the Rolling of Strip.** N. de Ball. *Archiv für technisches Messen,* 1953, no. 215, Dec., p. 269-272.

Three different beta-ray and two different compressed-air measuring instruments. Photographs, table, diagrams. 10 ref.
(S14, F23, Al, Cu, ST)

130-S. (German.) **The Pair of Strips for the Mechanical Amplification of Small Displacements.** Wilhelm Vogel. *Archiv für technisches Messen,* 1953, no. 215, Dec., p. 289-290.

Simple, rugged, sensitive and fairly accurate gage. Photograph, diagrams, graph. 4 ref. (S14)

131-S. **Experiences With Ultrasonic Reflectoscope Inspection of Main Seam Welds of Seven Large Spheres.** Levi Tarr. *ASTM Bulletin,* 1954, no. 196, p. 54-60; disc., p. 60.

Reflectoscope indications obtained in weld inspections are compared with radiographs, trepan plugs and Arcair gouging observations. Diagrams, photographs, tables, radiographs. (S13)

132-S. **Non-Destructive Tests of Field Welds on Welded Pipe Lines.** J. H. Lawson. *Australasian Engineer,* 1954, Jan., p. 57-60.

Recent developments in power station practice have led to adoption of radiographic examination of steam and feed piping operating at higher pressures and temperatures. (To be continued.)
(S13, K general)

133-S. **Standards of Temperature. II.** R. E. Wilson. *Industrial Heating,* v. 21, Feb. 1954, p. 252, 254, 256, 258, 260, 384-386.

Calibration and certification of standard instruments used in maintenance of an expanded temperature scale. Photographs, diagram. (S16)

134-S. **Light Metals Processing Quality Control.** Harold Bourassa and Wesley Chellman. *Light Metal Age,* v. 12, Feb. 1954, p. 12-13, 32.

Correlation between every-day inspection operations and statistical quality control as foundation for control programs. Photographs.
(S12, Al, Mg)

135-S. **Process Analysis by Control Charts.** Martin H. Saltz. *Tool Engineer,* v. 32, Mar. 1954, p. 66-71.

Development, interpretation and limitations of quality control charts. Statistical upper and lower tolerance limits. Graphs, charts, tables. (S12)

136-S. **Ultrasonic Testing of Steel Rolls and Steel Cylinders.** H. J. Seemann and W. Bentz. *Henry Brutcher, Altadena, Calif., Translation no.* 3118, 11 p. (From *Archiv für das Eisenhüttenwesen,* v. 24, nos. 1-2, 1953, p. 47-52.)

Previously abstracted from original. See item 199-S, July 1953.
(S13, ST)

137-S. **Electromagnetic Alternating-Field Technique for Nondestructive Testing of Ferrous Metals.** H. Goebbels. *Henry Brutcher, Altadena, Calif., Translation no.* 3139, 17 p. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 11-12, 1952, p. 443-448.)

Equipment developed by author for determining magnetic behavior in an alternating field. Photograph, graphs, diagrams, tables. 7 ref.
(S13, Fe)

138-S. **Procedure for Chemical Isolation of Iron Columbide From Austenitic Steel.** A. M. Dymov and S. S. Gorelik. *Henry Brutcher, Altadena, Calif., Translation no.* 3164, 5 p. (From *Zavodskaya Laboratoriya,* v. 16, no. 6, 1950, p. 648-650.)

Development of qualitative method for isolating iron columbide from chromium-nickel-molybdenum austenitic steel containing columbium in quantities 16 to 20 times the carbon content. Micrographs. 2 ref.
(S11, AY, Ni, Mo, Cr)

139-S. (Portuguese.) **Roughness of Cast Metallic Pieces.** Carlos Dias Brosch. *ABM (Boletim da associacao brasileira de metais),* v. 9, no. 32, July 1953, p. 344-365.

Surface appearance factors, finishing operations and precision of dimensions. Methods of investigating roughness. Graphs, diagrams, tables, micrographs. 14 ref. (S15)

140-S. (Spanish.) **Summary of Industrial Radiology.** A. Ruiz Rubio. *Ciencia y técnica de la Soldadura,* v. 3, no. 15, Nov.-Dec. 1953, 30 p.

General review. Diagrams, graphs, tables. (S13)

141-S. (Book.) **Higher Industrial Production With Electricity.** 145 p. British Electrical Development Association, 2, Savoy Hill, London, W.C.2, England. 9s.

First of a projected series of eight volumes presents a general review of progress in industrial fields. Chapters are included on welding,

factory layout, and electrical testing and inspection.
(S general, K1, K3)

142-S. (Book.) **The Instrument Manual. 2nd Ed.** 628 p. 1953. Union Trade Press, Ltd., 9 Gough Square, Fleet St., London E.C.4, England. £4.4s.

Covers engineering precision instruments and gages; instruments for determining physical and mechanical properties; optical instruments; instruments for the determination of texture and determination of compositional quality; measurement and control of time and speed; measurement and proportioning of weight; measurement and control of pressure and vacuum, liquid level depth and volume, specific gravity of liquids, and of temperature; measurement of fluid flow; hydrogen ion concentration, and control of humidity and dew point; automatic control; electrical measuring, general electronic, aeronautical, navigational, meteorological, and surveying instruments; measurement and control of conductivity; telemetering; measurement of viscosity; nucleonic instruments; organizations and publications interested in instrumentation; and an alphabetical list of manufacturers. (S general)

143-S. (Book.) **Methods for Emission Spectrochemical Analysis. ASTM Committee E-2 on Emission Spectroscopy.** 309 p. 1953. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $5.15 cloth; $4.50 paper.

Suggested methods are based on experience of submitters. Presents pertinent information for each method to permit its application in various laboratories and with different types of equipment. (S11)

144-S. (Book.) **1953 Supplement to Book of ASTM Standards, Including Tentatives. pt. I. Ferrous Metals.** 363 p. 1953. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

Contains extensively revised standards and the new and extensively revised tentatives that have been accepted since the appearance of the 1952 Book of ASTM Standards. (S22)

145-S. Direct Reading Spectrograph Gives Accurate Control in Aluminum Production. Donald L. Colwell and Oldrich Tichy. *Journal of Metals*, v. 6, Mar. 1954, p. 343-345.

Advantages of spectrographic control in manufacture of aluminum from scrap. Photographs, tables.
(S11, C general, Al)

146-S. Application of the ARL Quantometer to Production Control in a Steel Mill. H. C. Brown. *Journal of Metals*, v. 6, Mar. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Mar. 1954, p. 349-352.

Rapid means of analysis for production control of all types of stainless steel being used in analyses of final tests from a number of stainless, silicon and plain carbon steels. Tables, graphs. 2 ref.
(S11, D general, SS, ST)

147-S. How Position Tolerances Affect Gaging Requirements. II. Earle Buckingham. *Machinery*, v. 60, Mar. 1954, p. 186-192.

Tolerances established to control variations in size, form position and function. Diagrams. (S14)

148-S. Highly-Developed Equipment for Inspecting Close-Tolerance Parts. C. H. Wick. *Machinery (London)*, v. 84, Feb. 19, 1954, p. 397-401.

Multiple-dimension inspection and classifying machines of advanced design can be installed in production lines to enable high quality and close limits to be maintained in conjunction with rapid methods of manufacture. Photographs. (S14)

149-S. Design and Construction of Needle Thermocouples. W. Gerard Rauch. *Metal Progress*, v. 65, Mar. 1954, p. 71-74.

Couples having high thermo-elastic power hold their calibration well at temperatures up to 1110° F. Graphs, photographs. (S16)

150-S. Selection of Line Pairs for the Spectrographic Analysis of Low Alloy Steel. D. L. Fry and T. P. Schreiber. *Optical Society of America, Journal*, v. 44, Feb. 1954, p. 159-162.

Applicability of recent scientific information to procedures for spectrographic analysis of low-alloy steel under conditions of receiving inspection. Tables, graph. 7 ref.
(S11, CN)

151-S. Measure Surface Roughness. *Precision Metal Molding*, v. 12, Mar. 1954, p. 63-64.

Tool for controlling and checking microfinish on metal parts. Table. (S15)

152-S. Control of Strip Thickness in Hot and Cold Rolling by Automatic Screwdown. R. B. Sims and P. R. A. Briggs. *Sheet Metal Industries*, v. 31, no. 323, Mar. 1954, p. 181-190, 203.

Control method uses existing mill screws to reposition rolls and keep strip to gage. Accuracy of ± .001 in. has been attained. Charts, diagrams, photographs, graphs, tables. 9 ref. (S14, F23)

153-S. Non-Destructive Testing. *South African Mining and Engineering Journal,* v. 64, pt. 2, Feb. 6, 1954, p. 83.

Equipment available and range of application. (S13, S14, S15)

154-S. Nondestructive Testing of Structures. Lloyd J. Oye. *Welding Journal.* v. 33, Mar. 1954, p. 223-233.

Development and economic factors of inspecting welded structures with magnetic particle and penetrant inspection. Value of program as a means of encouraging greater use of welded structures. Graphs, table, photographs. 11 ref. (S13, K general)

155-S. Nondestructive Test Methods for Inspection of Welded Joints. R. J. Krieger, S. A. Wenk and R. C. McMaster. *Welding Journal,* v. 33, Mar. 1954, p. 154S-160S.

Application of techniques to ship structures. Table. 3 ref. (S13, K9)

156-S. Influence of Structure of Plain Carbon and Alloy Steels Upon the Spark Stream in Spark Testing. J. Hunger and O. Werner. *Henry Brutcher, Altadena, Calif., Translation no.* 3198, 32 p. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 7-8, 1952, p. 277-286.)

Previously abstracted from original. See item 440-S, 1952. (S10, CN, AY)

157-S. (English.) **Ultrasonic Testing of Mass Products in Water Immersion.** G. Keller. *Acta Technica Academiae Scientiarum Hungaricae,* v. 7, nos. 3-4, 1953, p. 359-387.

Testing equipment and methods permit reliable, swift detection and recording of discontinuities. Graphs, tables, diagrams, photographs, X-ray radiographs. 29 ref. (S13)

158-S. (German.) **New Possibilities of Nondestructive Material Testing in Aluminum Manufacturing Industry.** R. Pohlmann. *Aluminium,* v. 30, no. 2, Feb. 1954, p. 57-61.

Importance of supersonic test for determining breaks, segregations, slag inclusions, flaws and inhomogeneities. Diagrams, photographs. 3 ref. (S13, Al)

159-S. New Device Sorts Metals Accurately, Quickly. E. F. Weller and E. A. Hanysz. *Iron Age,* v. 173, Mar. 4, 1954, p. 162-165.

Nondestructive testing device accurately sorts mixed metals. Plating, foil and nonconductive film thickness can be measured. Photographs, graphs, diagrams, tables. (S10, S14)

160-S. Comparison Radiographs of Welds. Alexander Gobus and Noah A. Kahn. Paper from "Symposium on Nondestructive Testing". ASTM Special Technical Publication no. 145. p. 3-8.

Preparation of standard radiographs showing discontinuities usually found in production arc welds in steel. Photograph, radiographs. (S13, ST)

161-S. Fluoroscopy and Radiography With Iridium 192. C. Garrett, A. Morrison and G. Rice. Paper from "Symposium on Nondestructive Testing". ASTM Special Technical Publication no. 145. p. 9-20.

Preparation of source, protective equipment, operating techniques. Diagrams, graphs, photographs, tables, radiographs. 7 ref. (S13)

162-S. Weld Radiography. A Tentative Method for the Quantitative Evaluation of Defects. Oscar Masi. Paper from "Symposium on Nondestructive Testing". ASTM Special Technical Publication no. 145. p. 21-30.

Mechanical properties of welds determined by photometric studies of radiographs. Diagrams, photograph, radiographs, tables. (S13, Q general, K9, ST)

163-S. Critical Study of Techniques for the Testing of Materials by Ultrasonic Methods. Paul G. Bastien. Paper from "Symposium on Nondestructive Testing". ASTM Special Technical Publication no. 145. p. 31-42.

Trends in testing methods and consideration of errors caused by conditions of the ultrasonic emission on characteristics of the object tested. Diagrams, tables. (S13, S14)

164-S. Comparison of Nondestructive Tests on a Damaged Sternpost. A. De Sterke and H. Den Hartog. Paper from "Symposium on Nondestructive Testing". ASTM Special Technical Publication no. 145. p. 43-52.

Heavy steel castings in damaged ships were inspected by magnetic, gamma-ray, X-ray and ultrasonic methods. Results of tests compared. Photographs, diagrams, radiographs. (S13, CI)

165-S. Progress in the Field of Nondestructive Testing Through the Use of Ultrasonics. W. C. Hitt. Paper from "Symposium on Nondestructive Testing". ASTM Special Technical Publication no. 145. p. 53-75.

General review. Immersed scanning, flaw parallelism, reference blocks, sweep operation and typical parts inspected. Photographs, diagrams, reflectograms. (S13)

166-S. The Practical Application of Ultrasonic Nondestructive Testing. Werner A. Felix. Paper from "Symposium on Nondestructive Testing". ASTM Special Technical Publication no. 145. p. 76-88.

Results of tests on large forgings, steel castings and weld seams. Diagrams, photographs, tables. (S13, CI, ST)

167-S. Nondestructive Electronic Sorting of Metals for Physical Properties. Fritz Förster. Paper from "Symposium on Nondestructive Testing". ASTM Special Technical Publication no. 145, p. 89-98.

Instruments and their operation which eliminate effect of dimensional fluctuations almost completely. Graphs, photograph, diagrams. (S10, S14)

168-S. Establishing Standards for As-Cast Surfaces. Roy A. Loder. *American Foundryman,* v. 25, Apr. 1954, p. 44-45.

Duplicating casting finish desired by customer from order to order is possible when easily-understood standards are established. Photographs. (S22, S15, E general)

169-S. The Ultrasonic Testing of Forging Ingots. Robert N. Hafemeister. *ASTM Bulletin,* 1954, no. 197, p. 52-55.

Tests determine soundness of a forging by determining ultrasonically conditions of the ingot prior to forging. Oscillograms. (S13, ST)

170-S. The Correlation of the Betatron With Other Forms of Non-Destructive Testing. H. B. Norris. *ASTM Bulletin,* 1954, no. 197, p. 56-57.

Increased value of tests such as magnetic particle, ultrasonic and X-ray results when used in conjunction with the betatron. (S13)

171-S. Correlation of Gamma Radiography and Magnaflux Indications in the Inspection of Large Cast-Steel Connecting Rods. R. L. Thompson. *ASTM Bulletin,* 1954, no. 197, p. 58-59.

Detection of severe shrinkage cracking in a large steel casting. Correlation between gamma radiology and magnetic particle method resulted in greater information. Photographs. (S13, CI)

172-S. Application of Radio-Active Isotopes to Steel Foundry Radiography. L. Wilkinson. *Engineer,* v. 197, Mar. 12, 1954, p. 383-387.

Radioactive properties of cobalt-60, tantalum-182 and iridium-192 are largely complementary enabling thicknesses ranging from a ½ to 5 in. of steel to be examined with adequate contrast and sensitivity. Tables. (S19, CI)

173-S. Statistical Control in Metal-Working Operations. M. Whyte. *Institute of Metals, Journal,* v. 82, Mar. 1954, p. 334-344.

Sampling rates should be fixed in relation to quality and homogeneity of material being tested. Selection, control and sensitivity of routine tests. Graphs, table, charts. 17 ref. (S12)

174-S. A Simple Thermionic Vacuum Gauge. G. K. T. Conn and H. N. Daglish. *Journal of Scientific Instruments,* v. 31, Mar. 1954, p. 95-96.

Gage is simple and, because of form of anode, very easy to construct. Diagrams. 9 ref. (S14)

175-S. Examination of Machined Metal Surfaces. Use of Light-Profile Microscope. S. Tolansky. *Metal Treatment and Drop Forging,* v. 21, Mar. 1954, p. 103-111.

Light-profile microscope and how ordinary metallurgical microscope may be adapted. Application of technique to study of various bearing surfaces finished by different methods. Photographs, diagram, micrographs. 1 ref. (S15)

176-S. The Hallmark Through the Ages. Standard Marks for Gold and Silver. H. E. Lindsey. *Metal Treatment and Drop Forging,* v. 21, Mar. 1954, p. 131-137.

History of British system of hallmarking and its significance. Diagrams, tables. (S10)

177-S. Aspects of Angular Work. John E. Hyler. *Modern Machine Shop,* v. 26, Apr. 1954, p. 120-129.

Application of universal drafting machines and bevel protractors, special magnetic angle blocks, single and compound-angle sine plates, angle gage blocks and faceplate fixtures. Photographs, drawings. (S14)

178-S. A Preliminary Investigation of the Radiographic Visualization of Cracks. James W. Dutli and Gerold H. Tenney. *Nondestructive Testing,* v. 12, Mar.-Apr. 1954, p. 13-15.

Apparatus, techniques and results of experimental studies. Diagrams, graphs, photograph. (S13)

179-S. Some Unusual Radiographic Problems. M. D. Phillips, M. L. Rhoten and Clara Kimmel. *Nondestructive Testing,* v. 12, Mar.-Apr. 1954, p. 17-19.

Reviews and illustrates typical problems encountered in an X-ray laboratory. Radiographs, photographs. (S13)

180-S. Radiographic Characteristics of High Energy X-Rays. A. L. Pace. *Nondestructive Testing,* v. 12, Mar.-Apr. 1954, p. 21-25.

Utilization of high-voltage X-radiation in radiographic inspection reveals many interesting characteristics not observed with lower voltage X-rays. Graphs, diagrams, radiographs, photograph. (S13)

181-S. Application of Cesium 137 to Industrial Radiography. James W. Dutli and Grover M. Taylor. *Nondestructive Testing,* v. 12, Mar.-Apr. 1954, p. 35-38.

Fission-product isotope cesium-137 investigated for use as gamma-ray source for industrial radiography. Diagram, graphs, radiographs, tables. 6 ref. (S19)

182-S. An Investigation of Xeroradiography of Uranium With High Energy Sources. R. E. Cofield. *Nondestructive Testing,* v. 12, Mar.-Apr. 1954, p. 39-43.

Exposure conditions and operating techniques for xeroradiography of 0.125 to 1 in. uranium test objects developed by using both 1000 kv. X-ray and cobalt-60 sources. Tables, diagrams, xeroradiograph, graphs. 3 ref. (S13)

183-S. Soaking-Pit Instrumentation. L. F. Kopsa. *Instruments and Automation,* v. 27, Jan. 1954, p. 130-131, 141-142.

Instrumentation and combustion control for large one-way-fired soaking pits includes temperature control of recuperator and combustion air, pressure control of combustion air and flue draft, flow control of fuel and combustion air and various safety interlocks. Photographs, diagrams. (S16, S18, F1)

184-S. (Book.) **B.I.M.C.A.M. Handbook.** 133 p. 1953. British Industrial Measuring and Control Apparatus Manufacturers' Assn., 21 Tothill St., Westminster, London S.W. 1, England.

Instrumentation as it serves atomic energy, chemical, coal, electrical, gas, oil, and water industries. Contains numerous photographs. (S general)

185-S. (Book.) **Symposium on Non-Destructive Testing. ASTM Special Technical Publication no. 145.** 98 p. 1952. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $2.00. $1.50 to ASTM members.

Proceedings of meeting held at New York, June 1952. Fluoroscopy; electronic sorting; quantitative evaluation of defects; ultrasonic methods; and weld radiography. (S13)

186-S. Optical Comparison. *Aircraft Production,* v. 16, Apr. 1954, p. 124-127.

New prototype machine for the visual inspection of airframe parts. Photographs, diagrams. (S14)

187-S. How Optics Replace Costly, Time-Consuming Inspection. John P. Wright. *American Machinist,* v. 98, Apr. 12, 1954, p. 168-169.

Optical method of measuring alignment errors in micrometers. Photograph, diagrams. (S14)

188-S. Specifying Accuracy of Form for Machine Parts. Allan H. Candee. *Machine Design,* v. 26, Apr. 1954, p. 139-141.

Tolerances on form are deviations from zero in relation to some imaginary reference. Unless such tolerances can be interpreted in a way that applies to practical methods of measurement, there will be disagreement and confusion. Diagrams. (S14)

189-S. Ford Benefits by Tool Standardization. Charles H. Wick. *Machinery,* v. 60, Apr. 1954, p. 162-169.

Extensive program encompassing every phase of tooling and process for manufacture has reached the stage where its many benefits are becoming impressive. Photographs, diagrams. (S22, G general, TS)

190-S. Ultrasonic Testing a Versatile New Inspection Method. Charles H. Wick. *Machinery,* v. 60, Apr. 1954, p. 184-191.

Application to inspection and measurement problems is growing. Instantaneous indications and accurate location of internal defects are obtained economically. Photographs. (S13)

191-S. Metallurgist Assesses Impact of New Automatic Control Mechanisms. Arthur H. Allen. *Metal Progress,* v. 65, Mar. 1954, p. 65 + 8 pages.

Rapid progress in automation deterred by high cost of control mechanisms and in-born suspicion or lack of understanding of their functioning by management and production planners unfamiliar with new techniques. Photographs. 39 ref. (S18, A5)

192-S. Detecting Troubles. (Digest of "How to Detect the Type of an Assignable Cause", Paul S. Olmstead; *Industrial Quality Control,* v. 9, Nov. 1952, p. 32-36, and *Bell Telephone System,* Monograph 2106, Sept. 1953.) *Metal Progress,* v. 65, Apr. 1954, p. 178, 180, 182, 184.

To detect an assignable cause there are five general classifications of statistical tests—control charts,

extreme differences, runs, non-parametric association and analysis of variance. (S12)

193-S. New Hot Radiography Process Cuts Pipe-Weld Inspection Time by 50%. Alexander Gobus. *Power,* v. 98, Apr. 1954, p. 126-127.

Controlled cooling of weld before taking a radiograph is not needed. Postheating to relieve internal stresses is unnecessary. Photographs, diagram. (S13, K general)

194-S. Copper Penetration of Car Journals. *Railway Locomotives and Cars,* v. 128, Apr. 1954, p. 58-61.

Copper penetration between grain boundaries produces failure in journal bearings. Micrographs, table. (S21, Cu)

195-S. (French.) **Technical Progress and Economic Aspects of Gamma-Ray Radiography.** C. G. Carlström. *Fonderie,* 1954, Feb., no. 97, p. 3791-3802.

Outlines Swedish research in 1950-52. Sources of radiation, particularly Tm^{170}, diffused radiation, sensitivity and favorable economic aspects. Graphs, tables, diagrams, radiographs. 12 ref. (S13)

196-S. (French.) **Determination of Best Conditions for Examining Cast Iron by Gamma-Ray Radiography by Means of Cobalt 60.** Albert Blondel and Pierre Broquet. *Fonderie,* 1954, Feb., no. 97, p. 3803-3818; disc., p. 3818-3819.

Possible use for nondestructive testing in the foundry. Power of detection, techniques and experimental results. Radiographs, tables, diagrams, graphs. 12 ref. (S13, E general, CI)

197-S. (French.) **A-S10 G and A-S9 KG Preparation Standard.** Jean Montupet. *Fonderie,* 1954, Feb., no. 97, p. 3820-3824.

French specifications for composition and properties of two aluminum casting alloys. Production methods outlined. Table, micrographs. (S22, Al)

198-S. (French.) **Special Shapes in Aluminum Alloys Obtained by Extrusion and Their Application. III.** Pierre Pétrequin and Michel Costeraste. *Revue de l'Aluminium,* v. 31, no. 207, Feb. 1954, p. 75-83.

Normal tolerances on angle radius, contour, angular opening, smoothness, surface coarseness and finishing. Diagrams, tables, photographs. (S22, G5, Al)

199-S. (French.) **Interferrometric Method Using Superposition Fringes.** Michel Cagnet. *Revue d'Optique,* v. 33, no. 1, Jan. 1954, p. 1-25.

Theoretical and experimental study of properties and influence on sharpness and contrast. Diagrams, graphs, photographs, tables. (To be continued.) (S14)

200-S. (German.) **New Processes of Measuring Temperature for the Iron Industry. II. Measuring Temperature With Radiation Pyrometers.** Fritz Lieneweg. *Archiv für technisches Messen,* 1954, no. 218, Mar., p. 51-54.

Temperature measurement of bath, openhearth furnace roof and ingots. Use of color pyrometer for analyzing molten steel and predetermining its properties. Diagrams, graphs. (S16, D general, ST)

201-S. (German.) **The Ultrasound-Impulse Reflection Process of Non-Destructive Materials Testing. I. The Testing Device.** A. Lutsch. *Archiv für technisches Messen,* 1954, no. 218 Mar., p. 67-70.

Circuits and design of a Reflectoscope. Photographs, diagrams, tables. 13 ref. (S13)

202-S. (German.) **Extended Application of Non-Destructive Testing of Welds.** Otto Vaupel. *Schweissen und Schneiden,* v. 6, no. 3, Mar. 1954, p. 108-113; disc., p. 113-115.

Use of radioactive materials, combination of ultrasonic frequencies with X and gamma-rays and fluorescent magnetic powder. Table, diagrams. (S13)

203-S. (German.) **Measuring Temperature With Fluorescent Materials.** P. Brauer. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 9, Mar. 21, 1954, p. 285-287.

Coatings of various fluorescent materials with different critical temperatures permit measurement. Graphs, photographs. 5 ref. (S16)

204-S. Determination of Oxygen in Titanium and Zirconium by the Isotopic Method. A. D. Kirshenbaum, R. A. Mossman and A. V. Grosse. *American Society for Metals, Transactions,* v. 46, 1954, p. 525-533; disc., p. 533-539.

Using O^{18} as a tracer does not require quantitative separation or recovery of oxygen, thus giving accurate results. Accurate oxygen values were obtained by this method in range of 0.2 to 26%. Diagram, tables. 14 ref. (S11, Zr, Ti)

205-S. TV. Can It Help the Steel Industry. *British Steelmaker,* v. 20, Apr. 1954, p. 126-128.

How equipment works and costs of operation, along with actual installations now in service. Photographs. (S18)

206-S. Design for an Embedded Thermocouple. D. E. Upton. *Engineering,* v. 177, Apr. 16, 1954, p. 489.

Possibilities of mineral-insulated

base-metal thermocouple wire contained in a metal sheath. Units are steam tight. Diagrams. (S16)

207-S. **Simple Methods of Identifying Common Metals and Alloys.** G. DeVries. *Industrial Heating,* v. 21, Apr. 1954, p. 670, 672, 674, 676.

Fifteen simple tests to determine approximate composition. Tables. (S10)

208-S. **Standards for Aluminium Casting Alloys.** F. H. Smith. *Light Metals,* v. 17, Apr. 1954, p. 114-116.

Compares British with other specifications. (S22, Al)

209-S. **Current Light Alloy Specifications.** *Light Metals,* v. 17, Apr. 1954, p. 119-127.

Index to British specifications. Tables. (S22, EG-a)

210-S. **Open Hearth Bath Temperature Measurement.** J. H. Richards. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 96-98; disc., p. 107-109.

Use of immersion thermocouples in three openhearth shops, including installation and maintenance. (S16, D2)

211-S. **Thermocouple Bath-Temperature Measurement, Bethlehem Steel.** T. B. Winkler. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 98-102; disc., p. 107-109.

Design and maintenance, degree of control and effects on steel quality as experienced at Bethlehem's Lackawanna plant. Diagram, graphs. (S16, D2)

212-S. **Thermocouple Bath-Temperature Measurement, Steel Company of Canada.** J. P. Orton. *National Open Hearth Committee of the Iron and Steel Div. of the A.I.M.E., Proceedings,* v. 36, 1953, p. 103-107; disc., p. 107-109.

Tapping temperature control by direct immersion instruments and a spoon thermocouple method for control and study of refining periods. Table, graph. (S16, D2)

213-S. **Optical Pyrometers, Their Functioning and Maintenance.** H. E. Trout, Jr. *Steel Processing,* v. 40, Apr. 1954, p. 237-241, 254.

Pyrometers designed for mill service may be maintained and checked for accuracy in the mill. With reasonable care they will give consistent, reliable results. Photographs, diagrams. (S16)

214-S. **A Statistical Approach to Production and Design Problems.** A. G. Thompson. *Welding and Metal Fabrication,* v. 22, Apr. 1954, p. 131-138.

Heavy metal fabrication. Two methods based on establishing relationships between time and as few process variables as will yield desired degree of accuracy. Tables, graphs, diagrams. (S12, K general)

215-S. (Italian.) **Determination of Thickness of Anodic Coatings by Gravimetric Method.** A. Prati. *Alluminio,* v. 23, no. 1, Jan. 1954, p. 7-22.

Control by statistical analysis of a series of determinations. Tables, graphs. 4 ref. (S14, L19)

216-S. **Surface Waves at Ultrasonic Frequencies.** E. G. Cook and H. E. VanValkenburg. *ASTM Bulletin,* 1954, no. 198, p. 81-84.

Theory of mechanical wave propagation along surface of an extended solid medium adapting it to nondestructive materials testing. Graphs, diagram, tables, oscillogram. 12 ref. (S13)

217-S. **Electronic Units Make Fast Check on Part Quality.** D. Eldred. *Iron Age,* v. 173, Apr. 29, 1954, p.89-91.

Comparative checks on chemical composition, hardness, case depth and plating thickness quickly made with portable electronic units. Instruments and techniques described. Photographs. (S11, S14, Q29)

218-S. (German.) **Research on Test Specimens With Known Defects for Determining Operating Conditions of Ultrasonic Testing.** Erich Theis and Klaus Barteld. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 3-4, Mar.-Apr. 1954, p. 159-164; disc., p. 164.

Effects of impulse time, receiver sensitivity, contact and rear-wall surface conditions, position of defect in relation to sound beam and support of quartz on the ratio of defect echo to rear-wall echo indicate possibility of estimating size of defect. Diagrams, graphs. (S13)

219-S. (German.) **Surface Measurements by Interference Method.** Ernst Zehender. *Metalloberfläche,* Ausgabe A, v. 8, no. 4, Apr. 1954, p. 49-52.

Replica-film interference process measures depth of roughness of various grinds. Results compared to Leitz-Foster surface tester. Photograph, micrographs, table, diagrams. 8 ref. (S15)

220-S. (German.) **Shop Measurements of Layer Thicknesses in Metal Spraying Practice.** Hans Reininger. *Metalloberfläche,* Ausgabe A, v. 8, no. 4, Apr. 1954, p. 55-61.

Importance of thickness measuring and different magnetic meters. Photographs, tables, graphs. 12 ref. (S14, L23)

221-S. (Book.) **1953 Supplement, Book of ASTM Standards, Pt. II, Non-Ferrous Metals.** 278 p. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

Contains extensively revised standards and tentatives which have been accepted by ASTM since publication of the 1952 Book of ASTM Standards. (S22, EG-a)

222-S. How Functional Specifications Affect Gaging Requirements. Earle Buckingham. *Machinery,* v. 60, May 1954, p. 185-191, 211.

Tolerances established to control variations in size, form, position and function. Need for functional specifications and determination of gaging requirements. Diagrams. (S14)

223-S. Die Measurement and Inspection. J. G. Wistreich. *Wire and Wire Products,* v. 29, May 1954, p. 515, 570.

New instrument measures die angles; facilitate servicing operations in die rooms of wire mills. Photographs. (S14, F28)

224-S. (French.) **Contamination of Samples in the Electronic Microanalyzer.** Raymond Castaing and Jacques Descamps. *Comptes rendus,* v. 238, no. 14, Apr. 5, 1954, p. 1506-1508.

Observations during intense and prolonged bombardment of metallic surface by X-ray beams. Reduction of deposit formation by removing organic vapors. Spectrograms. 3 ref. (S11)

225-S. Sheet and Plated-Metal Measurements With a Phase-Angle-Type Probe. W. A. Yates and J. L. Queen. *Communication and Electronics,* 1954, May, p. 138-142.

Basic operating principles and design data for an instrument to measure metal thickness or plating depth for nonferrous materials. Graphs, diagrams. (S14, EG-a)

226-S. Unified Standards for Limits and Fits. Rowland Hill. *Engineering Journal,* v. 37, May 1954, p. 576-585.

Various national standard systems, development of new ABC system. Diagrams, graphs, tables. (S22, S14)

227-S. Multirange, Audiofrequency Thermocouple Instruments of High Accuracy. F. L. Hermach and E. S. Williams. *Journal of Research, National Bureau of Standards,* v. 52, May 1954, p. 227-234.

One is used with d.c. potentiometer for measurements of a.c. voltage and current with accuracy of 0.05% at frequencies up to 20 kc. per sec. Second is a 0.5% multirange volt-ammeter with simple circuits so thermal converter may be checked. Photographs, tables, graph, diagrams. 3 ref. (S16)

228-S. A Comparator for Materials of Low Magnetic Susceptibility. D. A. Abbott and R. Kilgour. *Journal of Scientific Instruments,* v. 31, May 1954, p. 155-158.

Magnetic states of weakly magnetic materials, such as phosphor bronze, copper and filled rubber compared. Diagrams, photographs. (S10, P16, Cu)

229-S Stainless Steel Welding Rods and Bare Electrodes. *Welding Journal,* v. 33, May 1954, p. 433-437.

Two years in drafting, new specifications for bare wire filler metals are available as AWS Specification A5.9-53T or ASTM Specification A371-53T. Diagrams, tables. (S22, T5, SS)

230-S. Automatic Inspection Incorporated in Cylinder Block Automation. Thomas Mac New. *Automotive Industries,* v. 110, June 1, 1954, p. 52-54. 128.

Manufacturing process used on new automobile engine. Photographs. (S general, CI)

231-S. Dimensions and Tolerances for Mass Production. (Summary-1). Earle Buckingham. *Machinery,* v. 60, June 1954, p. 184-190.

Steps necessary to complete dimensional information on drawings. Diagrams. (S22)

232-S. Instrument Pens. Leo Walter. *Mechanical World and Engineering Record,* v. 134, May 1954, p. 204-208.

Factors relating to use of pens in measurement and control instruments. Photographs, diagrams. 2 ref. (S14, S12)

233-S. (Czech.) **Casting Surface Control.** Otakar Moravek. *Slévarenstvi,* v. 2, no. 4, 1954, p. 104-106.

New oil test for surface defects of castings. Photographs, diagram, micrograph. (S13)

234-S. Choose Gear Inspection Methods to Meet Product Needs. Fred Bohle. *Iron Age,* v. 173, May 27, 1954, p. 120-125.

Functional and analytical methods described and compared. Photographs, diagrams, tables, graphs. (S14)

235-S. New Instrument Simplifies Diamond Die Inspection. Max Davies.

Iron Age, v. 173, June 10, 1954, p. 130-132.

Images cast on a screen from a light reflected through the diamond permit observation of scoring, cracks, rings, changes in taper and other flaws. Photographs. (S13)

236-S. **Determination of Tin-Iron Alloy Coating in Electro-Tinplate.** C. J. Thwaites and W. E. Hoare. *Journal of Applied Chemistry*, v. 4, May 1954, p. 236-244.

Coulometer method, involving measurement of quantity of electricity required to dissolve coating anodically in dilute hydrochloric acid, found suitable on relatively small specimens. Diagram, tables, radiogram. 11 ref. (S11, L17, Sn, Fe)

237-S. **Practical Production Tolerances.** Warren J. Grosjean. *Machine Design*, v. 26, June 1954, p. 108-114.

Design of electric timing units. Graphs, photographs, diagrams. (S14)

238-S. **Government Finishing Specifications. II.** N. E. Promisel and David M. Promisel. *Metal Finishing*, v. 52, June 1954, p. 95-101.

Metal coatings and surface treatments. Tables. (S22, L general)

239-S. **Precision in Measuring and Methods of Evaluation.** H. Schulz. *Microtecnic (English Ed.)*, v. 8, no. 2, 1954, p. 80-83.

Microscopes and magnification selection for industrial inspection and testing. Graphs, table, diagrams. (S general)

240-S. **Ultrasonics as a New Non-Destructive Means of Testing Materials in the Precision Mechanics Industries.** Reimar Pohlman. *Microtecnic (English Ed.)*, v. 8, no. 2, 1954, p. 84-88.

Principles, equipment and methods. Photographs, graphs, diagrams. 3 ref. (S13, S14, S15)

241-S. **Some Factors of Importance in Ultrasonic Testing.** J. B. Morgan. *Nondestructive Testing*, v. 12, May-June 1954, p. 13-18.

Effects of distance of a discontinuity below the surface of the article, geometry of the article, frequency, size and sensitivity of searching unit (transducer) and performance of ultrasonic instrument. Graphs. 2 ref. (S13, Al)

242-S. **Radioisotopes in Nondestructive Testing.** Paul C. Aebersold. *Nondestructive Testing*, v. 12, May-June 1954, p. 19-26.

Survey of industrial uses of gamma-ray emitters, including radiography, thickness measurement, liquid level, flow indication and wear testing. Diagrams, tables. (S19)

243-S. **Magna Scanning.** Arthur N. Haig. *Nondestructive Testing*, v. 12, May-June 1954, p. 27-28.

Novel technique combines radiographic scanning with magnification. Photographs. (S19)

244-S. **Immersed Ultrasonic Inspection With Automatic Scanning and Recording of Warning Signal.** John C. Smack. *Nondestructive Testing*, v. 12, May-June 1954, p. 29-33.

Inspection is applied automatically using contact or immersed testing techniques on important parts such as forged gun barrels and jet-engine rotors. Photographs, diagrams, chart. (S13)

246-S. **Eddy Current Testing by Impedance Analysis.** Richard Hochschild. *Nondestructive Testing*, v. 12, May-June 1954, p. 35-44, 51.

A review of AEC-supported development work at Hanford on eddy current methods for application requiring high sensitivity, dependability and rapid automatic handling during testing of metal parts. Graphs, diagrams, photograph. (S13)

247-S. **Discussion of Radiographic Characteristics of High Energy X-Rays.** D. A. Scag. *Nondestructive Testing*, v. 12, May-June 1954, p. 45-46.

Any betatron in the range of 15 to 30 mv. will give most of the advantages obtainable in megavoltage radiography. Graphs. 14 ref. (S13)

248-S. **A Graphical Method for Rapid Estimation of the Thickness of Evaporated Metal Films.** K. P. Nandy. *Review of Scientific Instruments*, v. 25, May 1954, p. 523-524.

Determines thickness of evaporated metal films using nomograph on a linear scale. Chart. 2 ref. (S14)

249-S. **Nondestructive Testing.** Donald C. Hart. *Steel*, v. 134, June 21, 1954, p. 124-125.

Applications of X-ray, radiography, magnetic particle, surface temper, dye penetrants and ultrasonics in automobile manufacture. Photographs, micrographs. (S13)

250-S. **Experiments on the Ultrasonic Testing of Cast Iron.** H. J. Seemann. *Henry Brutcher, Altadena, Calif., Translation no.* 3117, 13 p. (Condensed from *Giesserei, Technisch-Wissenschaftliche Beihefte*, 1952, no. 9, p. 403-408.)

Behavior of ultrasonic waves in gray irons with various graphite contents and structures. Tables, diagrams, reflectograms. 13 ref. (S13, CI)

251-S. Practical Experiences Gained in the Ultrasonic Inspection of Turbo Generator Rotor Forgings as Acceptance Test. R. Schinn. *Henry Brutcher, Altadena, Calif., Translation no.* 3230, 10 p. (Condensed from *Metall,* v. 7, no. 13-14, 1953, p. 502-506.)

Location of reflection zones and deductions concerning their nature. Information obtained by supplementary mechanical tests on trepanned cores confirmed the ultrasonic test results. Photographs, diagrams. (S13)

252-S. Ultrasonic Testing of Semifinished Light-Metal Products. I. Ultrasonic Testing of Light-Metal Semiproducts and Permanent-Mold Castings. II. J. Krautkrämer and W. Roth. *Henry Brutcher. Altadena, Calif., Translation no.* 3245, 12 p.; no. 3246, 9 p. (Condensed from *Zeitschrift für Metallkunde,* v. 44, no. 5, 1953, p. 198-202; p. 202-205.)

Previously abstracted from original. See item 250-S, 1953. (S13)

253-S. Ultrasonic Testing of Steel Rounds for Internal Defects. H. G. Brandt. *Henry Brutcher, Altadena, Calif., Translation no.* 3247, 9 p. (From *Stahl und Eisen,* v. 73, no. 26, 1953, p. 1717-1720.)

Previously abstracted from original. See item 99-S, 1954. (S13, TS)

254-S. (French.) **Examples of Industrial Application of Radioactivity.** J. Guéron. *Journal de physique et le radium,* v. 15, supp. no. 5, May 1954, p. 65A-75A.

Application based on absorption of radiation and analysis by activation or isotopic dilution. Diagrams, graphs. 39 ref. (S19)

255-S. (German.) **Ultrasonic-Impulse-Reflection Method for Non-Destructive Testing of Materials. II. Practical Experiences During the Testing of Various Materials and Shapes of Specimens as Well as Supports. III. Practical Experience During Examination of Welded Seams and Pipes. Radiography.** A. Lutsch. *Archiv für technisches Messen,* 1954, no. 219, Apr., p. 81-84; no. 220, May, p. 109-110.

Velocity of impulses, elastic constants, reflection on boundary surfaces and testing procedure. Diagrams, table, graphs. 25 ref. (S13)

256-S. Failure of Rotating Shafts Due to Repairs by Welding. *British Engine, Boiler & Electrical Insurance Co. Ltd., Technical Report,* New ser., v. I, Nov. 1952, p. 114-123.

In certain cases welding is inadvisable or if used must be applied with particular care. Photographs, micrographs, diagrams. (S21)

257-S. In Stainless Wire—Nondestructive Test Gives Austenite, Martensite Percentages. Samuel Storchheim. *Iron Age,* v. 174, July 1, 1954, p. 108-111.

Method combines magnetic test and X-ray diffraction techniques. Graphs, tables, photograph. (S11, M23, SS)

258-S. Reproducibility of the Freezing Temperature of High-Purity Zinc. E.H. McLaren. *Journal of Applied Physics,* v. 25, June 1954, p. 808.

Possibility of using freezing temperature of zinc as an alternative to sulfur fixed point on the international temperature scale. 3 ref. (S16, Zn)

259-S. Charts Used for Controlling Quality of Assemblies. Martin H. Saltz. *Tool Engineer,* v. 33, July 1954, p. 74-77.

Steps for setting up charts for control of defects. Photograph, graphs. (S12)

260-S. Isotope Inspection Controls Quality of Product. E. W. Bratton. *Tool Engineer,* v. 33, July 1954, p. 78-81.

Nuclear gaging of coated abrasives. Photographs, diagram, graphs. (S12)

261-S. Specifications for the Painting of Metals. Joseph Bigos. Paper from "Surface Protection Against Wear and Corrosion". American Society for Metals, p. 378-395.

Writing of specifications for performance, test requirements and composition. Example. 32 ref. (S22, L26)

262-S. (German.) **Lead Intensifying Screens for Industrial Radiographs.** H. Möller and W. Nosbüsh. *Schweissen und Schneiden,* v. 6, no. 6, June 1954, p. 254-256.

Process and rate of intensification, contrast and surface condition. Graphs. (S13)

263-S. (German.) **Progress in the Testing of Materials With Ultrasonics.** Josef Krautkrämer. *Zeitschrift für Mettallkunde,* v. 45, no. 4, Apr. 1954, p. 154-157.

Development of impulse-echo process. Decrease in wear, increase in rate of testing, various new constructions and metallographic applications. Diagrams, photographs. (S13, ST)

264-S. (German.) **Determination of Lines of Segregation in an Ingot of an Aluminum-Magnesium-Silicon Alloy by Means of Ultrasonic Reflection Method.** Gerhard Lucas and Adolf Lutsch. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 158-160.

Method eliminates necessity of using X-ray or making ingot unusable for further processing. Interpretation of test results and method of continuous control of ingots. Diagrams, photographs.
(S13, Al, Mg, Si)

265-S. (German.) **Methods of Ultrasonic Testing in Metals Processing Industry.** Reimar Pohlman. *Zeitscrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 161-165.

Possibilities for using impulse-echo and irradiation methods. Diagrams, photographs, graphs, micrograph. (S13)

266-S. (German.) **Theoretical and Experimental Basis of the Non-Destructive Testing of Materials With the Eddy Current Process. III. Process With Annular Coil for the Quantitative Non-Destructive Testing of Materials.** Friedrich Förster and Kurt Stambke. **IV. Practical Eddy-Current Instruments With an Annular Coil for the Quantitative Non-Destructive Testing of Materials.** Friedrich Förster. **V. The Quantitative Testing of Cracks of Metallic Materials by the Annular Coil.** Friedrich Förster and Helmut Breitfeld. **VI. Measuring Without Contact of the Thickness and Conductivity of Metallic Surface Layers of Foils and Plates. Pt. I. Theoretical Basis.** Friedrich Förster. **VII. The Magneto-Inductive Testing of Cracks in Steel.** Friedrich Förster. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 166 + 36 pages.

Theoretical and experimental basis for quantitative utilization. Industrial and metallographic application. Method for separating various effects. Magnatest-D process. Graphs, diagrams, tables. 66 ref. (S13, S14)

267-S. (German.) **Non-Destructive Tests of Cracks of Tungsten Rods by the Eddy-Current Method.** Albert Keil and Carl-Ludwig Meyer. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 194-196.

Practical experiences with the testing of rods of 2 to 8 mm. diameter. Typical defects, causes and possibilities of recognition. Micrographs. 8 ref. (S13, W)

268-S. (German.) **The Testing of Metal Coatings on Insulating Materials by an Eddy Current Process.** Albert Keil and Gertrud Offner. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 200-203.

Manufacturing processes for production of conductive metal layers. Conductivity, concept of "equivalent silver thickness" and measurement. Charts. 4 ref. (S15, P15, Ag)

269-S. (German.) **Industrial Application of a Probe Coil Instrument to Nonferrous Metals.** Gerhard Bunge. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 204-206.

Instrument requires only a 10 mm. scanning surface for registering the conductivity directly. Photograph, graphs. (S10, P15, Cu, Cr)

270-S. (German.) **Theoretical and Experimental Basis of the Electromagnetic Sorting According to Quality of Steel Semifinished Products and Steel Parts. I. Magneto-Inductive Process With Consideration Only of the Fundamental Wave.** Friedrich Förster. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 206-211.

Effect of electrical conductivity, permeability, diameter of the specimen and testing frequency. Tables, diagrams. 15 ref.
(S10, P15, P16, ST)

271-S. (German.) **Industrial Experience With Electromagnetic Sorting of Steels.** Helmut Krainer. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 212-217.

Possibilities and limitations of process as preliminary sorting process. Interpretation of results. Diagrams, micrographs. 16 ref.
(S10, ST)

272-S. (German.) **Industrial Experience With the Eddy Current Testing of Cracks in Semifinished Steel Products.** Karl Sprungmann. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 227-230.

Factors effecting registration of cracks. Advantages of the process and pilot plant results. Photographs, graphs. (S13, ST)

273-S. (German.) **Electronic Classification of Defects by a Multitest Device.** Friedrich Wieland and Friedrich Rosche. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 231-233.

Application for automatic sorting of cracked antifriction bearings. Diagrams. (S13)

274-S. (German.) **Theoretical and Experimental Basis of the Electromagnetic Sorting According to Quality of Steel Parts. IV. The Residual Field Process.** Friedrich Förster. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 233-238.

Relation between residual force and coercive power. Sorting arrangement and industrial applications. Charts, diagrams. (S10, ST)

275-S. (German.) **Critical Consideration of the Magnetic Sorting of Steel Parts in Mass Production.** Johannes Ortheil. *Zeitschrift für Metallkunde,* v. 45, no. 4, Apr. 1954, p. 243-244.

Application of residual field method. Possibilities of testing uniformity of structure and chemical composition. Photograph, graph. (S10, S11, ST)

276-S. (German.) **Rapid, Non-Destructive Determination of Plate Anisotropy by Means of Residual Pole Process.** Friedrich Förster and Gustav Zizelmann. *Zeitschrift für Metallkunde,* **v. 45, no. 4, Apr. 1954, p. 245-249.**

Method, importance, examples and reproducibility of anisotropy measurements. Diagrams, graphs, photographs. 13 ref. (S13)

277-S. (German.) **Material Testing With Betatron-X-Rays.** R. Wideröe. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, nos. 15-16, June 1, 1954, p. 450-456.

Use of new equipment for numerous tests. Diagrams, graphs, photographs. (S general)

278-S. A.I.S.I. Standard Alloy Steel Compositions. Openhearth and Electric Furnace Alloy Steels. *Metal Progress,* v. 66, July 1954, p. 112-B.

Covers bars, billets, blooms and slabs up to 200 sq.in., 18 in. wide or 10,000 lb. Revision of February 1954. Table. (S22, AY)

279-S. Statistics and Planning Tests at Elevated Temperatures. W. J. Youden. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 219-222.

Emphasizes need to test a group of specimens large enough to be statistically determinant. Table. 2 ref. (S12)

280-S. Crack Density Studies in "Stresscoat". A. J. Durelli and S. Okubo. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 153-160.

Systematic study of crack density as a function of the unidimensional state of stress in the material under the coating. Graphs, photograph. (S13)

281-S. Interpretation and Application of Inspection Test Data. P. V. Faragher. *Society for Experimental Stress Analysis, Proceedings,* (Annual Volume), v. 11, no. 2, 1954, p. 217-218.

Relation between inspection test results and the properties which are required to make an efficient design. (S general, A1)

282-S. (Russian.) **Devices for Determining Metal Shrinkage and Growth.** T. M. Smirnov. *Liteinoe Proizvodstvo,* 1954, no. 3, May-June, p. 16-17.

Design and performance. Table, diagrams, graphs. 5 ref. (S14)

283-S. (Russian.) **Ultrasound and Its Application.** S. Ia. Sokolov. *Priroda,* v. 43, no. 3, Mar. 1954, p. 21-34.

Methods of excitation and propagation, effect on substances; registration of physico-chemical processes, testing metals, and ultrasonic microscope. Photographs, diagrams. (S13, P10)

284-S. (Swedish.) **Standards of Gray Cast Iron.** M. Itzel. *Gjuteriet,* v. 44, no. 5, May 1954, p. 84-86.

Standard test bars and minimum tensile strengths required in various countries. Table. 7 ref. (S22, Q23, CI)

285-S. Automatic Ultrasonic Inspection. *Automotive Industries,* v. 111, July 15, 1954, p. 49, 104.

Description of equipment installed at Allison Division, General Motors Corp. Photograph. (S13)

286-S. The Use and Scope of Iridium-192 for the Radiography of Steel. R. Halmshaw. *British Journal of Applied Physics,* v. 5, July 1954, p. 238-243.

Definition obtainable and its importance with different types of flaw. Ranges of thickness of welds and castings on which satisfactory flaw-sensitivity should be obtained. Graphs, tables. 10 ref. (S13, ST)

287-S. Some Consideration of the Errors of Brightness and Two-Colour Types of Spectral Radiation Pyrometer. E. C. Pyatt. *British Journal of Applied Physics,* v. 5, July 1954, p. 264-268.

Instrument limitations. Derives chart from which errors can be calculated for any pyrometer for all possible values of emissivity. Diagrams, graphs. (S16)

288-S. Some Applications of Ultrasonic Testing. *Machinery (London),* v. 85, July 2, 1954, p. 3-10.

Applications of the reflectoscope. Photographs. (S13)

289-S. Selection of Methods for Nondestructive Inspection. ASM Committee on Nondestructive Inspection. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 159-163.

Definition of methods, evaluating soundness of steel welds, detecting cold shuts in cast bronze bushings, inspection of heat resisting metals, determining soundness of aircraft turbine disks, and sorting mixed lots of steel. Tables. 26 ref. (S13, S10)

290-S. (French.) **Standardization in the Field of Metallurgy.** Pierre Salmon. *Revue de métallurgie,* v. 51, no. 6, June 1954, p. 380-384.

Standardization as means of resolving problems between manufacturers and users of iron and steel products. (S22, Fe, ST)

291-S. (German.) **Experiments on the Efficiency of a 31-Mev. Betatron for Irradiation of Steel.** Hermann Möller, Walter Grimm and Helmut Weeber. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 5-6, May-June 1954, p. 279-291.

Application in nondestructive testing reveals important advantages over X-ray method. Photographs, graphs, diagrams. (S13, ST)

292-S. (German.) **Electrical Control of Furnace Atmosphere and Exhaust Gases With Modern Gas-Analysis Equipment.** A. Naumann. *Berichte der deutschen keramischen Gesellschaft,* v. 31, no. 6, June 1954, p. 194-199.

Development of two industrial flue-gas analysis instruments. Graphs, diagrams, photographs. (S11)

293-S. (Spanish.) **Nondestructive Testing of Welded Structures by Means of Ultrasonic Waves.** F. Ramirez Gomez. *Ciencia y técnica de la Soldadura,* v. 4, no. 16, Jan.-Feb. 1954, 22 p.

Characteristics of ultrasonic apparatus. Examples of tests on butt-joint welds. Photographs, diagrams, table, graph. (S13, K9)

294-S. **Materials Testing by Betatron Radiography.** R. Wideröe. *Engineers' Digest,* v. 15, July 1954, p. 277-279. (Translated from *Zeitschrift des Vereines Deutscher Ingenieure,* v. 96, nos. 15-16, June 1, 1954, p. 451-456.)

Previously abstracted from original. See item 277-S, 1954. (S general)

295-S. **Proposed Tentative Specifications for Nickel-Tin Bronze Castings.** *Foundry,* v. 82, Aug. 1954, p. 149-150.

Comprehensive data sheet. Tables. (S22, Cu)

296-S. **Design Considerations Applying to Specification of Surface Finish for Machined Parts.** James F. Hagen and Earl E. Lindberg. *General Motors Engineering Journal,* v. 1, July-Aug. 1954, p. 12-17.

Analysis of surface geometry. System specifies degree of surface finish in terms of the average roughness, waviness and lay of the surface. Diagrams, micrographs. 4 ref. (S15)

297-S. **A Discussion of Instrumentation for Determining Surface Roughness of Machined Parts.** James F. Hagen and Earl E. Lindberg. *General Motors Engineering Journal,* v. 1, July-Aug. 1954, p. 18-23.

Thorough study indicates the most suitable instruments for production-line use are of the tracer type. Photographs, diagrams, graph. (S15)

298-S. **X-Ray While Hot to Speed Pipe Welding Inspection.** J. K. Bell. *Industry & Welding,* v. 27, Aug. 1954, p. 58 + 4 pages.

Nondestructive examination by hot radiography permits quality checks on-the-spot at any stage and at temperatures up to 1200° F. Photograph, diagram, table. (S13, K9)

299-S. **Prevention of Sucker-Rod Failures by Electronic Inspection.** F. Lawrence Resen. *Oil and Gas Journal,* v. 53, Aug. 2, 1954, p. 82-84.

Electronic inspection reduces shutdown periods. Photographs, graphs, table. (S13)

300-S. (German.) **Non-Contact Measurement of Strip Thickness During the Finishing Process.** H. Fassbender. *Aluminium,* v. 30, no. 7, July 1954, p. 290-297.

Equipment and method for use of beta-rays. Graphs, tables, diagrams, photographs. 5 ref. (S14, Tl, Sr, Y)

301-S. (German.) **New Process of Measuring Bearing Length of Drawing-Die Holes.** Werner Lueg. *Stahl und Eisen,* v. 74, no. 14, July 1, 1954, p. 874-876.

Design and operation of two new instruments for inspection of wire dies. Diagram, photographs. (S14, F28)

302-S. **Pig Iron and Blast Furnace Ferroalloys, Chemical Compositions.** *American Iron and Steel Institute, Contributions to the Metallurgy of Steel,* no. 44, 1954, 20 p.

Standard grades, sampling and chemical analysis. Tables. (S22, B11, B22, CI, Fe)

303-S. **Reference Book Sheets. Limits and Fits for Cylindrical Parts. IV-VI.** *American Machinist,* v. 98, Aug. 2, 1954, p. 143, 145, 147.

Proposal for an American standard of clearance locational and transition locational fits. Tables, graphs. (To be continued.) (S22, S14)

304-S. **Aluminum Specs Are Standardized.** *Steel,* v. 135, Aug. 9, 1954, p. 94-95.

New system of uniform alloy designations will clear up confusion from special numbers. Basis is four-digit number, last two digits of which are same as old number. Tables. (S22, Al)

305-S. Year's Use Proves Value of Betatron. A. N. Haig and H. B. Norris. *Steel,* v. 135, Aug. 9, 1954, p. 102-103.

Savings at Allis-Chalmers Mfg. Co. paid off the $350,000 cost before the 22-million volt machine had its first birthday. Photograph, graph. (S13)

306-S. (German.) **Principles of Control Technique.** H. Bönnhoff. *Fette, Seifen, Anstreichmittel,* v. 56, no. 6, June 1954, p. 399-404.

Automatic temperature, pressure, quantity and flow controls. Diagrams. 17 ref. (S16, S18)

307-S. (German.) **Continuous Contactless Measuring of Weight Per Unit Area or Thickness With the Aid of Radioactive Substances.** Fritz Alberts. *Kautschuk und Gummi,* v. 7, no. 7, July 1954, p. 157WT-162WT.

Design and operation of device, advantages of method. Diagrams, graphs, photographs, tables. 6 ref. (S14)

308-S. (German.) **Testing Thin Metal Films With an Electrical Measuring Process.** Albert Keil and Gertrud Offner. *Sprechsaal,* v. 87, no. 14, July 20, 1954, p. 345-347.

Measuring thickness and conductivity of nonmagnetic coatings on ceramics. Photograph, graph. 5 ref. (S14, P15)

309-S. (Spanish.) **Nondestructive Testing of Welds by Means of Ultrasonic Waves.** F. Ramorez Gomez. *Ciencia y técnica de la Soldadura,* v. 4, no. 17, Mar.-Apr. 1954, 10 p.

Relation to X-ray inspection. Apparatus and its applications. Defect identification criteria. Graphs, micrographs, diagrams. 14 ref. (S13, K9, ST)

310-S. (Book.) **British Engine, Boiler & Electrical Insurance Co. Ltd., Technical Report.** New ser. v. I. 215 p. Nov. 1952. British Engine, Boiler & Electrical Insurance Co. Ltd., 80 Lombard St., London E.C.3, England.

Corrosion and failures in tubes, joints and other parts of boilers, pressure vessels, engines, turbines, electrical machinery and cranes. Test procedures to determine causes of failures. Photographs, tables, diagrams, micrographs. 20 ref. (S21, R11)

311-S. Photographic Pyrometry. J. W. Londeree, Jr. *American Ceramic Society, Journal,* v. 37, Aug. 1954, p. 354-360.

Method whose speed is limited only by the exposure time required to obtain an image on a photographic film. Graphs, photographs, table. 4 ref. (S16)

312-S. Controlling Product Quality. *Battelle Technical Review,* v. 3, Aug. 1954, p. 83-84.

Nondestructive testing by industry controls quality and lowers production costs. (S12)

313-S. Practical Foundry Application of Radioisotopes. V. G. Behal. *Canadian Metals,* v. 17, July 1954, p. 22-23.

Gamma-camera with iridium^{192} source used for inspection of steel castings. Diagrams, radiograph. (S13, CI)

314-S. A.I.S.I. Standard Boron Steel Compositions. Openhearth and Electric Furnace Alloy Steels. *Metal Progress,* v. 66, Aug. 1954, p. 112-B.

Data sheet, revision of Feb. 1954. (S22, AY)

315-S. Autoradiographic Studies of Surface Detail With Chromium-51. L. E. Preuss. *Nucleonics,* v. 12, Aug. 1954, p. 30-32.

Unique approach combines methods of vacuum evaporation, shadow casting and autoradiography. Diagrams, photographs, table. 36 ref. (S15)

316-S. Why Parts Fail. J. A. Bennett and G. W. Quick. *Product Engineering,* v. 25, Aug. 1954, p. 129-134.

Precautions to consider in design, fabrication and use of metal parts in reducing service failures. Photographs. 7 ref. (S21)

317-S. Radioisotopes in Industrial Control. G. D. Calkins and Meyer Pobereskin. Paper from "Nuclear Engineering. Pt. I.". American Institute of Chemical Engineers, p. 259-266.

Utilization of radioactive techniques in the measurement of location motion, measurement of physical properties, detection of flaws, tracing of materials, and determination of chemical composition. 39 ref. (S19)

318-S. Quality Control in the Manufacture of Zinc. Technique of Approximating a 3-Variable Problem Solution. Harold L. Springer. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 1-14.

Clarifies concept of multivariate regression. Relation of concept of multivariate regression to analysis of control chart data. Diagrams, tables. (S12, Zn)

319-S. Ultrasonics — Theory and Practice. W. C. Hitt. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 57-66.

Survey of equipment and methods for ultrasonic flaw detection. Diagrams, photographs. (S13)

320-S. Quality Control in the Manufacture of Miniature Precision Bearings. Charles J. Hudson. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 93-100.

Equipment, records and procedures. Diagrams, graphs, table. (S12)

321-S. Foundry Quality Control for Short Runs. Allin P. Deacon. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 185-198.

Core, sand and cupola control. Detection of defects in castings. Diagrams, tables, photographs. (S12, E general)

322-S. Quality Control at Warner Gear. Francis E. Jolliffe. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 229-239.

Statistical quality control of machining operations. (S12, G17)

323-S. Quality Control of Tubular Steel Products. W. T. Rogers. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 289-302.

Procedures employed by Lorain Works, National Tube Division, U. S. Steel Corp. Graphs, charts. 7 ref. (S12, F26)

324-S. Statistical Design of Experiments in Metallurgical Research. S. Gilbert. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 445-455.

Analysis of variables and fractional replicate design. Tables. 9 ref. (S12)

325-S. A Survey of the Use of Statistical Methods by A.S.Q.C. Members in the Metals Industry. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 579-616.

Presentation and analysis of data from replies to questionnaires. Types of quality control and sampling methods, charts and reports used. Tables, diagrams. (S12)

326-S. (English.) **An Automatically Recording Magnetic Balance.** Tokutaro Hirone, Seijiro Maeda and Noboru Tsuya. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 1, Feb. 1954, p. 67-76.

Construction and applications of device for plotting magnetization-temperature curves. Photographs, diagrams, graphs. (S16, P16)

327-S. (Russian.) **Characteristics of Accelerated Testing of Machine Durability and Distribution of Test Results.** R. V. Kugel'. *Vestnik Mashinostroeniia,* v. 34, no. 5, May 1954, p. 3-9.

Analysis of factors causing distortion of data obtained under forced tests. Diagrams, micrographs. 7 ref. (S12)

328-S. Why Did It Fail? M. V. Herasimchuk. *American Foundrymen's Society, Preprint no.* 54-58, 1954, 7 p.

Procedure whereby equipment failures can be quickly classified as design problems or metallurgical problems. Graph, photographs. (S21, AY)

329-S. Reference Book Sheets. Limits and Fits for Cylindrical Parts. VII-IX. *American Machinist,* v. 98, Aug. 16, 1954, p. 151, 153, 155.

Interference locational, force and shrink fits. Tables, diagrams. (To be continued.) (S22, K13)

330-S. Technical Features of the New British Standard System of Limits and Fits. H. G. Conway. *Institution of Mechanical Engineers, Proceedings,* v. 168, no. 8, 1954, p. 233-245.

Derivation of tolerances, review of problems of metrology, possible future extensions of system. Diagrams, tables, graphs. (S22, K13)

331-S. Tool and Gage Inspection. Michael C. Curtis. *Instruments and Automation,* v. 27, Aug. 1954, p. 1314-1316.

General foreman of a large tool-inspection department reports on the instruments, personnel and functions of his department. Photographs. (S14)

332-S. Nondestructive Tests Check Forging Quality, Spot Equipment Troubles. S. C. Totaro. *Iron Age,* v. 174, Aug. 12, 1954, p. 117-119.

Frequent magnetic particle inspections during the forging process pay off by nipping costly troubles in a hurry. Photographs. (S13, F22, CN)

333-S. A Surface-Scanning Pyrometer. R. B. Sims and J. A. Place. *Journal of Scientific Instruments,* v. 31, Aug. 1954, p. 293-294.

Instrument designed to measure at high speed the distribution of temperature over a body too hot for contact methods. Diagram, graphs. (S16)

334-S. Measurement of Plane Surface Finish by Photometry. Jean M. Péters. *Microtecnic* (English Ed.), v. 8, no. 3, 1954, p. 119-125; disc., p. 125-126.

Based on comparative deflection of reflected light. Diagrams, graphs, tables. (S15)

335-S. The Necessity and the Conditions for Producing Internationally Comparable Rockwell-C Hardness Values. K. Meyer. *Microtecnic* (English Ed.), v. 8, no. 3, 1954, p. 138-148.
Reviews problems and equipment. Photographs, graphs, diagram. (S22, Q29)

336-S. Ultrasonic Test for Bonding Flaws. *Steel,* v. 135, Aug. 23, 1954, p. 102-103.
New method of inspection permits sound waves to detect lack of bond in terms of thickness measurement. Diagrams. (S13, S14)

337-S. Statistical Quality Control Techniques Offer Cost Savings. D. D. Pettit. *Western Metals,* v. 12, Aug. 1954, p. 49-51.
Management, product and tool engineering, and manufacturing personnel jointly exercise the function of controlling quality of a product. Charts. (S12)

338-S. Absorption of Ultrasonic Waves by Single Crystals. S. Y. Sokolov. *Henry Brutcher, Altadena, Calif., Translation no.* 3004, 6 p. (From *Zhurnal Tekhnicheskoi Fiziki,* v. 19, no. 2, 1949, p. 274-278.)
Usefulness for detection of crystalline flaws. Oscillograms. 2 ref. (S13)

339-S. Effect of Heat Treating Upon the Results of Spectroanalysis of Steel and Welds. E. S. Kudelya. *Henry Brutcher, Altadena, Calif., Translation no.* 3272, 12 p. (From *Avtomaticheskaya Svarka,* v. 6, no. 1, 1953, p. 27-33.)
Effect of heat treatments of joints and steel on spectro-analysis. Tables, radiographs. 11 ref. (S11, J general, ST)

340-S. Quantitative Flaw Detection in Metals by the Slip-Over Coil. F. Förster and H. Breitfeld. **Theoretical Principles of Contactless Determination of Thickness and Conductance of Metallic Coatings, Foils, and Sheet.** F. Förster. (Parts V-VI of "Theoretical and Experimental Principles of Nondestructive Testing by Eddy Current Method".) *Henry Brutcher, Altadena, Calif., Translation no.* 3329 and 3292, 20 p. (Condensed from *Zeitschrift für Metallkunde,* v. 45, no. 4, 1954, p. 188-193, 197-199.)
Previously abstracted from original. See item 167-S, 1954. (S13, S14)

341-S. (German.) **Photometric Determination of Bismuth With Thiourea. I. Performance in Nitric Acid Solution.** Walter Nielsch and Gerhard Böltz. *Zeitschrift für analytische Chemie,* v. 142, no. 5, 1954, p. 321-329.
Methods for determining bismuth. Graphs, tables, ultra-violet spectra. 30 ref. (S11, Bi)

342-S. (German.) **A New Photometric Method of Determining Cobalt With Nitrilotriacetic Acid.** Walter Nielsch and Gerhard Böltz. *Zeitschrift für analytische Chemie,* v. 142, no. 5, 1954, p. 329-334.
Includes graphs, tables. 2 ref. (S11, Co)

343-S. (German.) **A Simple Instrument for Sorting Mixed Materials by Magnetic Induction.** Kurt Matthaes. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 428-429.
Simple, rapid method of sorting steels. Circuit diagram, table. (S10, ST)

344-S. Practical Inspection of Mine Gear. R. Jeffrey. *Colliery Guardian,* v. 189, Aug. 12, 1954, p. 191-196.
Methods applicable are fluorescent, magnetic-particle, and ultrasonic detection and radiography. Tables. (S13)

345-S. Foundry Data Sheet. *Foundry,* v. 82, Sept. 1954, p. 151-152.
ASTM tentative specifications for automotive gray iron castings. (S22, CI)

346-S. Sampling Plans Reduce Inspection Time. Martin H. Saltz. *Tool Engineer,* v. 33, Sept. 1954, p. 45-50.
Characteristics of sampling by attributes or by variables. Photograph, graph, tables. 4 ref. (S12)

347-S. (German.) **The Service Life of PtRh Thermocouples.** H. Ehringer. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 596-598.
Effects of impurities, time, temperature and atmosphere. Graphs. 7 ref. (S16, Pt, Rh)

348-S. (German.) **A Highly Sensitive and Wide-Range Magnetic Induction Thickness Meter.** R. Berthold. *Metalloberfläche,* Ausgabe A, v. 8, no. 8, Aug .1954, p. 117-119.
Device measures nonmagnetic films on a ferromagnetic base. Diagram, table, graphs, photograph. 1 ref. (S14)

349-S. (Russian.) **Experimental Investigation of Topography of Magnetic Field From Natural Surface Defects in Ferromagnetic Bodies.** N. N. Zatsepin. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1224-1228.
Measuring apparatus utilizes relation of electric resistance of bismuth to magnetic field. Diagrams, graphs, micrographs. 4 ref. (S14, P15, P16, Fe, Bi)

350-S. (Pamphlet.) **The Aluminum Association Alloy Designation System for Wrought Aluminum.** Effective Oct. 1, 1954, 4 p. July 1954. The Aluminum Association, 420 Lexington Ave., New York 17, N. Y.

Four-digit index system. Conversion tables indicating new designations for old nomenclature. (S22, Al)

351-S. (Book.) **Quality Control.** N. L. Enrick. Ed. 2. 181 p. 1954. Industrial Press, 148 Lafayette St., New York 13, N. Y. $4.00.

Ready-made sampling plans, sample control charts, compressed limit gages, basis of proper specifications. New Part II covers additional control charts for variables, control charts for variance and for acceptance inspection, and analysis of variance. (S12)

352-S. (Book.) **Quality Control Convention Papers.** Edward M. Schrock, editor. (Eighth Annual Convention.) 648 p. 1954. American Society for Quality Control, 70 East 45th St., New York 17, N. Y. $3.50.

Sixty papers, separately abstracted, delivered at the 1954 annual convention. Statistical methods, apparatus, and techniques for control of quality in manufacturing operations and in business forecasting. (S12)

353-S. Statistical Quality Control for the Foundryman. Ross Martin, Jr. *American Foundryman,* v. 26, Sept. 1954, p. 50-55.

Based on a mathematical foundation, technique is developed to enable better decisions to be made for production on a higher quality level. Graphs. (S12, E general)

354-S. New Wrought-Aluminum Designations. I. *American Machinist,* v. 98, Sept. 13, 1954, p. 187, 189.

Adoption of new system of alloy designations for wrought aluminum and aluminum alloys. Old-to-new and new-to-old conversion tables. Tables. (S22, Al)

355-S. A Thermostat With Control Temperature Independent of Ambient Temperature. A. M. Thompson and R. W. Archer. *Institution of Electrical Engineers, Proceedings,* v. 101, pt. 2, no. 82, Aug. 1954, p. 450-452.

Circuit for precise temperature control of oven for crystal frequency standard. Circuits, diagrams. 6 ref. (S16)

356-S. Acceptance Standards for Magnetic Inspection Improve Quality, Lower Rejection Rates on Critical Parts. Stephen Maszy. *Iron Age,* v. 174, Sept. 23, 1954, p. 114-115.

Examples of realistic acceptance standards. Diagrams. (S13, S22, ST)

357-S. Compact Radiographic Inspection Setup Combines Safety With Good Handling. J. A. Kearney and J. P. Brennan. *Iron Age,* v. 174, Sept. 9, 1954, p. 128-130.

Use of X-ray and cobalt-60 isotope in quality control. Photographs, diagram. (S13)

358-S. Ultrasonics in Maintenance Planning and Product Quality Control. R. L. Rectenwald. *Iron and Steel Engineer,* v. 31, Sept. 1954, p. 77-85; disc., p. 85-87.

Equipment, techniques and applications of ultrasonic nondestructive testing. Photographs, diagrams. 3 ref. (S13)

359-S. New Numbering System for Wrought Aluminum Alloys. *Metal Progress,* v. 66, Sept. 1954, p. 112B.

Data sheet showing conversions, new to old and old to new. (S22, Al)

360-S. Inspection of Metals With Ultrasonic Surface Waves. Willard C. Minton. *Nondestructive Testing,* v. 12, July-Aug. 1954, p. 13-16.

Theory and techniques for detecting various types of defects. Diagrams, graphs, table, photograph. 6 ref. (S13)

361-S. Factors in the Use of Black Lights for Fluorescent Inspection. J. E. Clarke. *Nondestructive Testing,* v. 12, July-Aug. 1954, p. 21-25.

Light sources, intensity requirements and operation, care and maintenance of equipment. Diagram, graphs. (S13)

362-S. Further Investigations on the Industrial Use of the 31-MEV Betatron. R. Wilderoe. *Nondestructive Testing,* v. 12, July-Aug. 1954, p. 27-32.

Applications, advantages and limitations of betatron rays. Advantages of stereo-radiographs. Diagrams, graphs. 9 ref. (S13)

363-S. Trends in Testing Techniques. Don M. McCutcheon. *Nondestructive Testing,* v. 12, July-Aug. 1954, p. 33-40.

Theory, practice and characteristics of various classes of nondestructive tests. Photographs, tables, micrograph, graphs, oscillographs. 12 ref. (S general)

364-S. Gamma-Radiography in Oil Storage Installations. II. C. C. Bates. *Petroleum,* v. 17, Sept. 1954, p. 312-314, 342.

Nondestructive testing of welds. Photographs, diagrams. (To be continued.) (S13, K9, CN)

365-S. (German.) **Rapid Electrographic Identification of Alloy Steels and Alloys of the Ferrous Metals.** Erich Fitzer. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 7-8, July-Aug. 1954, p. 321-326.

Semiquantitative method of determining Cr, Co, Ni, Mn, Mo, W, Si, Fe and Cu in steels and cast irons and description of an industrially feasible instrument. Diagrams, charts. 16 ref. (S10, AY)

366-S. (German.) **Magnetic and Electromagnetic Sorting of Semifinished Steel Parts and Parts Produced by Mass Production.** Friedrich Förster. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 7-8, July-Aug. 1954, p. 383-392.

Methods of sorting steel parts according to conductivity, hardness, and defects. Diagrams, photographs, and graphs. 21 ref. (S10, ST)

367-S. Factors Governing the Surface Finish of Iron Castings. J. H. Gittus. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Aug. 1954, p. 376-389 + 2 plates.

Cause and measurement of casting roughness. Diagrams, graphs, photograph, tables. 19 ref. (S15, E25, CI)

368-S. Thickness Gauge for Dielectric Materials. W. W. Woods. *Communication and Electronics,* 1954, Sept., p. 320-323.

Instrumentation based upon variation of mutual induction between two coils when brought near a metal surface. Diagram, graphs. 8 ref. (S14)

369-S. Eddy-Current Testing: A New Tool Makes Inspection Automatic. Richard Hochschild. *Control Engineering,* v. 1, Oct. 1954, p. 35-41.

Principle of device, applications, flexibility and versatility. Graphs, diagrams, circuit diagrams, photograph, table. (S13)

370-S. Melting Control of Electric Furnace Steel With a Direct-Reading Spectrometer. George C. Delplace. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 77-79.

Analytical procedure, elements determined and sampling. (S11, S12, AY, CN)

371-S. Validity of Results of Rapid Methods of Analysis for High-Alloy Steels. M. L. Windle and W. H. Magrun. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 87-91.

Discussion of choice of analytical methods and degree of accuracy and relations to production control. Tables. (S11, AY)

372-S. Measurement of Bottom Shell Temperature in the Electric Furnace. D. G. Harris. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 91-94.

Basic principle of new method and test results. Diagrams, graph. (S16, D5)

373-S. Measurement of Bottom Shell Temperatures. H. C. Bigge. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 95-100.

Importance of fabrication of rammed linings and bottom thermocouple. Diagrams, graphs. (S16, D5)

374-S. Tentative Specifications for Ferromanganese. *Foundry,* v. 82, Oct. 1954, p. 227.

ASTM designation A99-53T as a data sheet covering seven grades. (S22, B22, Fe, Mn)

375-S. Automatic Radiography With Cobalt-60. Jack Hile. *Materials & Methods,* v. 40, Sept. 1954, p. 108-109.

Unique method developed to check soundness of 2000 compressor blades. Photographs. (S13)

376-S. Nondestructive Testing Detects Corrosion Damage. F. A. Prange and J. F. Headrick. *Oil and Gas Journal,* v. 53, Sept. 27, 1954, p. 82.

Ultrasonic methods of measuring wall thickness of pressure equipment in petroleum refineries. (S14, R7)

377-S. (German.) **Optical Instruments for the Testing of Materials and Surface Investigations.** A. Metz. *Metall.* v. 8, nos. 17-18, Sept. 1954, p. 677-680.

Design, operation and performance of the "Metallux" microscope, the Bollenrath dilatometer, the "Durimet" hardness tester, a light-slot instrument and a surface-testing apparatus with a vibrating pickup. Photographs, diagram. (S15, S13)

378-S. (German.) **X-Ray Equipment for X-Ray Testing of Materials.** H. Link. *Metall,* v. 8, nos. 17-18, Sept. 1954, p. 684-687.

Portable and stationary equipment for nondestructive testing—performance and operation. Comparison with equipment using radioactive isotopes. Photographs. (S13)

379-S. Observations on the Application of Statistical Techniques to ASTM Standards. Charles A. Bicking. *ASTM Bulletin,* 1954, no. 200, Sept., p. 48-52.

Reviews advances made in applying statistical techniques to standardization of industrial products. Tables. 9 ref. (S12, S22)

380-S. (French.) **Flaw Detections in Metal Tubes by Means of Induced Electric Currents.** G. Gauthier. *Revue de métallurgie,* v. 51, no. 8, Aug. 1954, p. 537-540.

Anomalies in diagrams produced by the electric-current tests. Micrographs, diagram. (S13)

381-S. (French.) **Some Applications of Ultrasonic Testing of Rails.** L. Beau-

jard and V. Husarek. *Revue de métallurgie,* v. 51, no. 8, Aug. 1954, p. 558-568.

Reviews experiments in which ultrasonic methods of examination revealed presence of defects due to fatigue (oval spots, horizontal fissures due to scaling) or defects already existing in the rail (longitudinal or vertical faults). Photographs, diagrams, graphs. 8 ref. (S13, Q7, CN)

382-S. (Book.) **ASTM Specifications for Steel Piping Materials.** 370 p. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $3.75.

Specifications for carbon and alloy steel pipe and tubing in conveying liquids, gases and vapors; boiler, superheater and still tubes; heat exchanger and condenser tubes; and for castings, forgings, welded fittings, bolts and nuts. Classification of austenite grain size in steels and American standard covering wrought steel and wrought iron pipe. (S22, ST, AY)

383-S. Ultrasonic Testing. Edward F. Weller, Jr. *Aircraft Production,* v. 16, Oct. 1954, p. 422-425.

Resonance, transmission and frequency modulation methods. Equipment; applications. Photographs, diagram, circuit. (S13, S14, S15)

384-S. Probolog—An Application of Eddy Current Techniques to Non-Destructive Testing. William J. Warren. *Corrosion,* v. 10, Oct. 1954, p. 318-323; disc., p. 323.

Principles of eddy current phenomena and their application. Diagrams, graphs, photograph. (S13)

385-S. A Reflectometer for the Assessment of Surface Texture. J. Halling. *Journal of Scientific Instruments,* v. 31, Sept. 1954, p. 318-320.

Simple optical-mechanical instrument which gives a rapid assessment of the surface texture of machined surfaces. Photographs, diagram, graph. 6 ref. (S15)

386-S. Non-Destructive Testing. C. M. Gilmour. *Metal Industry,* v. 85, Sept. 17, 1954, p. 229.

Sigma-test instrument based on electrical measurements. Can be used for electrical conductivity, detection of contamination, adjustment of furnace charges, sorting of metals, degrees of age hardening, surface cracks. (S10, S11, S13, P15)

387-S. How to Assure Quality Production Through Tool and Gage Control. Thomas J. Bizzoco. *Modern Machine Shop,* v. 27, Oct. 1954, p. 160 + 7 pages.

A virtually foolproof system for tool, instrument and gage control, featuring economy and practicability of operation. Tables, diagram. (S14)

388-S. A Copper Resistance Temperature Scale. T. M. Dauphinee and H. Preston-Thomas. *Review of Scientific Instruments,* v. 25, Sept. 1954, p. 884-886.

Excellent thermal contact achieved by fine commercial copper wire, attached with Formel varnish to a copper base, which has sufficiently stable and reproducible resistance temperature characteristics to be used as a resistance thermometer in the temperature range 20-320° K. Graphs, table. 4 ref. (S16, Cu)

389-S. Magnetic Comparator Testing of Steel Cartridge Cases. S. S. Rice. *Tooling and Production,* v. 20, Oct. 1954, p. 83 + 5 pages.

Profitable application of nondestructive testing for quality control. Use for sorting on basis of various properties detectable by magnetic changes. Photographs, graphs. (S10)

390-S. Ultrasonic Transparency of Steel and Its Bearing on the Results Obtained With the Pulse-Reflection Technique. A. Michalski. *Henry Brutcher, Altadena, Calif., Translation no.* 3308, 15 p. (Abridged from *Stahl und Eisen,* v. 74, no. 1, 1954, p. 26-33.)

Previously abstracted from original. See item 113-S, 1954. (S13)

391-S. (Dutch.) **Copper and Copper Alloys. XIV. Special Brass.** G. R. de Jager. *Metalen,* v. 9, no. 17, Sept. 15, 1954, p. 272-276.

Table of standardized alloys in Germany, England, and the United States gives compositions and mechanical properties. (S22, Cu)

392-S. (German.) **Measuring Temperature in Industry.** H. Frisch. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben,* v. 99, nos. 8-9, Aug.-Sept. 1954, p. 172-176.

Vapor-pressure, liquid-expansion, resistance, thermoelectrical and radiation thermometers described. Diagrams, photograph. 5 ref. (S16)

393-S. (German.) **Microcondition of Surface. Status of Measuring Technique.** J. Perthen. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 25, Sept. 1, 1954, p. 855-863.

Types of viewers, scanners, interference microscopes and electrical and electronic recorders for studying surface conditions. Graphs, photographs, diagrams. 19 ref. (S15)

394-S. Measurement of Plating Thickness. G. Howells. *Corrosion Technology,* v. 1, Sept. 1954, p. 233-236.

Review of chemical, magnetic, X-ray and eddy-current methods. Graphs, diagrams. (S14, L general)

395-S. Common Sense Nondestructive Testing. R. C. McMaster. *Nondestructive Testing,* v. 12, Sept.-Oct. 1954, p. 13-17.

Normal use of human senses illustrate basic principles of nondestructive testing. Drawings. (S general)

396-S. Tools of Inspection. Rebecca H. Sparling. *Nondestructive Testing,* v. 12, Sept.-Oct. 1954, p. 19-28.

Nondestructive tests for indicating quality or soundness of metals. Diagrams. (S13)

397-S. The Theory of Eddy Current Testing in One (Not-So-Easy) Lesson. Richard Hochschild. *Nondestructive Testing,* v. 12, Sept.-Oct. 1954, p. 31-40.

Theory and applications. Diagram, graphs. (S13)

398-S. (Russian.) **Application of Oscillographic Polarography for Quantitative Determination of Titanium.** Ia. P. Gokhshtein, S. I. Siniakova and V. D. Iukhtanova. *Zhurnal Analiticheskoi Khimii,* v. 9, no. 5, Sept.-Oct. 1954, p. 255-264 + 2 plates.

Effect of rate of variation of potential on magnitude of maximum current for reduction of titanium. Effect of molybdenum, chromium and nickel. Tables, oscillographs, graphs. (S11, Ti, Fe, Mo, Cr, Ni)

399-S. Design Specifications for Stainless Steel, Type 301. E. W. Hammer and R. E. Petersen. *American Iron and Steel Institute, Preprint,* 1954, 22 p.

Tentative specifications for various applications. Data for design of columns. Diagrams, graphs. (S22, T general, SS)

400-S. New Thickness Gages for Metallic Coatings. *Metal Finishing,* v. 52, Oct. 1954, p. 52-55.

Three nondestructive instruments developed by National Bureau of Standards. Photographs. 7 ref. (S14, L general)

401-S. New Concepts in Spot X-Ray of Welded Structures. Harold Hovland. *Welding Journal,* v. 33, Oct. 1954, p. 962-965.

Portable X-ray equipment to replace trepanning inspection of welds. Photographs. (S13, K9, CN)

402-S. Electronic 'Private Eyes' Guard Against Structural Flaws in Jet Components. A. S. Billings. *Western Metals,* v. 12, Oct. 1954, p. 63-65.

Applications of X-ray metallography, fluorescent and die penetrants, magnetic particle inspection, spectroscopy. Photographs. (S13)

403-S. Ultrasonic Testing of Intricately Shaped Parts. E. Martin and K. Werner. *Henry Brutcher, Altadena, Calif., Translation no.* 3291, 20 p. (From *Archiv für das Eisenhüttenwesen,* v. 24, nos. 9-10, 1953, p. 411-422.)

Relationship between path of ultrasonic waves and location and size of defects by the pulse reflection method using oblique incidence of beam. Photographs, diagrams, reflectograms. 1 ref. (S13)

404-S. (Russian.) **Use of Radioactive Isotopes in Industry.** M. B. Neiman. *Priroda,* v. 43, no. 10, Oct. 1954, p. 16-27.

Applications in metallurgy, nondestructive testing, chemical and petroleum industries and communication. Table, diagrams, photographs, graphs. (S19)

405-S. (Book.) **Handbook on Radiography.** 71 p. 1950. Atomic Energy of Canada, Ltd., Commercial Products Division, P.O. Box 93, Ottawa, Canada. $2.00.

Sources of radiation; fundamentals, equipment, and applications of radiography. (S13)

406-S. (Book.) **Standards in a Changing World. Fourth National Standardization Conference, Proceedings.** 74 p. 1953. American Standards Association Inc., 70 East 45th St., New York 17, N. Y. $3.00.

Advantages, examples, and applications of standards for manufacturing, design, procurement, and inventory control. (S22)

SECTION T

APPLICATIONS of METALS in EQUIPMENT and INDUSTRY

1-T. Magnesium Alloy and the Printer. R. S. Cox and R. V. Cannon. *Electrotypers and Stereotypers, Journal,* v. 18, Oct. 1953, p. 300, 303.

British-made "Primag" is now available as alternative to copper and zinc for photoengraving. Table. (T9, Mg)

2-T. Tests of Fittings on Insulated Aluminum Cable. Joel Tompkins and E. K. Lanctot. *Power Apparatus and Systems,* 1953, no. 8, Oct., p. 865-873; disc., p. 873-874.

Aluminum fittings and cables were found to be satisfactory if properly designed. Test procedures. Photographs, graphs, diagrams. (T1, Al)

3-T. New Planes Need More Titanium. *Aviation Week,* v. 53, Nov. 23, 1953, p. 22.

Effect on the future design requirements in the aircraft industry if light metal output should fail. (T24, Ti)

4-T. Waffles Stiffen Highspeed Structures. Irving Stone. *Aviation Week,* v. 53, Nov. 23, 1953, p. 38, 40, 43.

Makeup of waffle-type integrally stiffened panels used in tests on high-speed aircraft. Photographs, graphs. (T24)

5-T. Nuclear Physics and Metals. L. G. Cook. *Chemistry in Canada,* v. 5, Nov. 1953, p. 236-238.

Special requirements of the nuclear chemist for metals and how they may be met. Problems involved in handling uranium, plutonium and other rare earth metals. Tables, graphs. (T25, U, Pu)

6-T. Metallurgical Aspects of the Development of Small Gas Turbines. W. L. Slosson. *Journal of Metals,* v. 5, Nov. 1953, p. 1419-1426.

Brief description of construction and operation principles of Model 502 turbine. Configuration of turbine illustrated and basic operation diagram outlining airflow, operating temperatures and component speeds given. Photographs, diagram, tables. (T25)

7-T. Which Grade of Carbide Should You Use? Guy Monacelli. *Machine and Tool Blue Book,* v. 49, Nov. 1953, p. 162-166, 168, 170.

Various available Carboloy grades and their advantages and applications as cutting tools. Photographs, tables. (T6, W)

8-T. High Capacity Magnesium Dry Cells. R. C. Kirk, P. F. George and A. B. Fry. *Magnesium,* 1953, Nov. p. 10-13.

Composition, characteristics and capacity. (T1, Mg)

9-T. Die Materials for Limited Production Runs. John L. Everhart. *Materials & Methods,* v. 38, Nov. 1953, p. 92-95.

Properties, characteristics and applications of dies made from zinc-base alloys, antimonial lead, bismuth-base alloys, hardwood (maple), densified wood, reconstituted wood and cast phenolic plastics. Table, photographs. (T5)

10-T. Specialized Propeller Production. *Metal Industry,* v. 83, Oct. 23, 1953, p. 335-338.

Equipment, plant layout and operating procedures of foundry engaged almost exclusively in production of ships' propellers. Photographs. (T22)

11-T. Body Engineers Technical Convention. James R. Custer. *Automotive Industries,* v. 109, Dec. 1, 1953, p. 48-49, 106.

Plastic dies, reinforced plastic bodies, aluminum die castings, air conditioning and other timely developments. Graphs. (T21, Al)

12-T. Printing Metals. II. Leslie G. Luker. *British Printer,* v. 66, Nov.-Dec., 1953, p. 48-51.

Stereo and electro-backing alloys, and problems of impurities, remelting and reviving. Photographs. (T9)

13-T. Cast Iron Process Vessels. H. P. Voznick. *Chemical Engineering Costs Quarterly,* v. 3, Oct. 1953, p. 97-111.

Application and advantages of cast iron for covers, jackets, heaters and agitators. Example of cost estimation. Photographs, tables, graphs. (T29, CI)

14-T. The Use of Steel Sheet for the Construction of Shielded Rooms. A. M. Intrator. *Communication and Electronics,* 1953, Nov., p. 599-604; disc., p. 604-605.

Principles of shielding. Details of design and construction for rooms to be used in making low-level electronic or electrical measurements. Photographs, diagrams, graphs. 3 ref. (T26)

15-T. Metallurgical Light on Aircraft Heater Failures. *Metal Progress,* v. 64, Dec. 1953, p. 136, 138, 140.

Digested from "Metallurgical Aspects of Aircraft Heaters", *Aircraft Heating Digest,* v. 3, no. 1, Aug. 1952, Surface Combustion Corp. (T27, R general, Q general, SS, Ni)

16-T. Rigidized Metals for Architectural Applications. *Sheet Metal Worker,* v. 45, Nov. 1953, p. 54-55, 108.

Development of sheet metals with increased strength and rigidity. Characteristics, applications and cost. Photographs. (T26)

17-T. High-Heat Influence on Aircraft Design. DC-7 Uses Titanium on Nacelle Structure. E. H. LaBombard. *Western Metals,* v. 11, Nov. 1953, p. 45-48.

Problems encountered due to increased operating temperatures of high-speed airplanes. Photographs, graphs, diagram. (T24, Q general, Ti)

18-T. Plain Bearings. Some Aspects of the Design of Bearings for Automobile Engines. *Automobile Engineer,* v. 43, Nov. 1953, p. 463-473.

Advantages and shortcomings of various alloys. Ways to select best material. Graphs, micrographs. (T7, T21, SG-c)

19-T. The Use of High Alloy Castings in Heat Treating Equipment. *Canadian Metals,* v. 16, Nov. 1953, p. 28, 30, 32.

Applications of iron-chromium and iron-chromium-nickel castings in recuperators, annealing retorts, and muffles. (T5, J general, CI)

20-T. Producing Piston Rings Calls for Close Tolerances. *Canadian Metals,* v. 16, Nov. 1953, p. 50, 52-53.

Types of rings and machining and finishing operations. (T7)

21-T. High Alloy Castings Resist High Temperature. *Engineering Journal,* v. 36, Nov. 1953, p. 1473-1474.

Discusses iron-chromium and iron-chromium-nickel alloys. Compositions and applications in recuperators and retorts. (T5, SG-h)

22-T. Newer Types of Metallic Recuperators. H. Weineck. *Iron & Steel,* v. 26, Dec. 1953, p. 557-560.

Construction and use of recuperators made of cast iron, steel and heat resistant alloys. 8 ref. (T5, CI, SS, SG)

23-T. Production of Permanent Magnets in a Modern Plant. *Machinery,* v. 60, Dec. 1953, p. 208-210.

Fabrication procedures employed at Carboloy department of General Electric Co. Photographs. (T1, G general, SG-n)

24-T. Non-Ferrous Materials for Springs. J. Lomas. *Machinery Lloyd (Overseas Ed.),* v. 25, Nov. 21, 1953, p. 74-77.

Composition and properties of beryllium copper and nickel alloys. (T7, Cu, Ni, SG-b)

25-T. Production of Tractor Gearboxes. *Machinery (London),* v. 83, Nov. 27, 1953, p. 1035-1044.

Equipment, plant layout and operating procedures. Photographs, diagrams. (T3)

26-T. The Development of a Copper-Silver-Lead Alloy for Bearings. G. Llewelyn. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 215-220.

Tests showed that a copper-silver-lead alloy containing 30% silver and 40% lead possesses most of the usual properties associated with bearing alloys. Graphs, photographs, tables, micrographs. 8 ref. (T7, SG-c, Cu, Ag, Pb)

27-T. Carbon in the Engineering and Metallurgical Industries. IV. Refractories, Electrodes and Other Metallurgical Uses. V. S. Kingswood. *Metallurgia,* v. 48, no. 289, Nov. 1953, p. 221-227.

Applications of carbon in iron and steel making and heat treating. Fabrication of carbide tools. Photograph, diagrams, graphs, tables. 21 ref. (T5, T6, H general, C)

28-T. Aluminum in Communication Systems. E. Glaus. *Modern Metals,* v. 9, Nov. 1953, p. 34-35, 38.

Use of aluminum in tele-communications by the Swiss. The latest and most promising developments

are in the field of high-frequency transmission. Photographs. (T1, Al)

29-T. Magnesium Gains in Die Casting Field. George Hodgson. *Modern Metals,* v. 9, Nov. 1953, p. 40, 44, 46, 48.

Magnesium is no longer a "substitute" material. It is accepted on an equal status with zinc and aluminum. Economic factors now favor magnesium in many applications. Diagrams, table, photographs.
(T general, E13, Mg)

30-T. Magnesium Die Castings. G. F. Hodgson. *Precision Metal Molding,* v. 11, Dec. 1953, p. 40-43, 91-94.

Applications in automobiles, home appliances, business machines and photographic equipment.
(T21, T10, T9, Mg)

31-T. Welding Rods, a Production Control Problem. *Steel Processing,* v. 39, Nov. 1953, p. 597-599, 610.

Facilities and procedures for electrode production at A. O. Smith Co., Lancaster, Pa. Photographs.
(T5, K general)

32-T. High Alloy Castings in Heat Treating Equipment. *Steel Processing,* v. 39, Nov. 1953, p. 601-603.

Design of equipment for use under conditions of high temperature and pressure. Photographs.
(T5, AY)

33-T. (German.) **The Proper Utilization of Aluminum Alloys in the Chemical and Food Industry.** K. Renner. *Chemische Technik,* v. 5, no. 9, Sept. 1953, p. 521-525.

Processing, application and properties of aluminum alloys for reduced consumption of pure aluminum. Examples of application. Diagrams, graphs, photographs, tables. 9 ref.
(T29, P general, Q general, Al, Mg, Si)

34-T. Aluminum Conductors in Telephone Cable. C. Kreisher. *Bell Laboratories Record,* v. 31, Dec. 1953, p. 465-469.

Properties of aluminum, advantages of its use in cable conductors and difficulties encountered in this application. Graph, photographs.
(T1, Al)

35-T. Platinum in the Finishing, Jewellery and Metallurgical Industries. *Industrial Finishing (London),* v. 6, Nov. 1953, p. 282, 284-286, 288.

Use of platinum metals in jewelry, electrical contacts, electrodes, thermocouples, and artistic and decorative items. Photograph.
(T9, T1, T8, EG-c)

36-T. Design and Application of Bronze Slippers in Universal Couplings. J. Robert Lottes. *Iron and Steel Engineer,* v. 30, Dec. 1953, p. 123-128; disc., 128.

Case histories indicate that proper alloy selection can increase slipper performance and reduce costs. Diagrams, photographs, graphs.
(T5, Cu)

37-T. Which Stainless Steel? Richard E. Paret. *Material & Methods,* v. 38, Dec. 1953, p. 98-101.

Corrosive environment, service conditions and fabrication methods must be considered in deciding which grade of steel is most suitable for given application. Photographs.
(T general, SS)

38-T. Metallic Materials for a Steam Power Plant Operating at 1130° F. Herbert Buchholtz, Wilhelm Ruttmann and Rudolf Schinn. *Metal Progress,* v. 65, Jan. 1954, p. 116-120, 180, 182, 184, 186, 188.

Report on construction steels. Data given on compositions, strength properties, provision for safety at high temperatures, intergranular disintegration, stress corrosion, effect of combustion gases and steam, toughness and welding problems. Photograph, table, graphs, micrograph. (T25, Q general, CN, SS, AY)

39-T. Battle Birds. Richard Cheney. *Steelways,* v. 9, Dec. 1953, p. 8-11.

Current research program in guided missiles. Photographs. (T2)

40-T. Aluminium Winding in Electrical Equipment. A. A. Defoe. *Times Review of Industry,* v. 7, new ser., Dec. 1953, p. 28-30.

Applications in motors, generators and transformers. Photographs, tables. 18 ref. (T1, Al)

41-T. Vitreous-Enamelled Aluminium Stock. C. R. Sigler. *Light Metals,* v. 16, Dec. 1953, p. 402-403.

Advantages and uses of structural panels. Photographs. (T26, L27, Al)

42-T. Aluminium Foil as a Thermal Insulator and as a Vapour Barrier. Joseph B. Singer. *Light Metals,* v. 16, Dec. 1953, p. 403-405.

Properties and uses. Graph, tables, diagram. 7 ref. (T27, Al)

43-T. Prefabricated Aluminium Motel. *Light Metals,* v. 16, Dec. 1953, p. 415.

Design and structural details. Photographs. (T26, Al)

44-T. Metalworking in Making Closures for Containers. Walter Rudolph. *Modern Industrial Press,* v. 15, Dec. 1953, p. 13, 16, 18, 20.

Equipment and procedures for making caps and other closures. Photographs. (T10, G general)

45-T. TV Antennas. Big Business for Aluminum Tubing. F. L. Church. *Modern Metals,* v. 9, Dec. 1953, p. 86-88.

Types and fabrication. Photographs. (T1, Al)

46-T. A New Etching Development for Magnesium. H. E. Swayze. *Process Engravers' Monthly,* v. 60, Nov. 1953, p. 334, 339.

Preparation of printing plates. (To be continued.) (T9, Mg)

47-T. Metals for Reactor-Core Construction. Henry A. Saller. *Science,* v. 119, Jan. 1, 1954, p. 4-8.

Problems of the materials engineer in reactor-core construction. Tables, graphs. 16 ref. (T25, P general, Q general, U, Th, Al, Be, Mg, Zi)

48-T. Some Problems in the Development of a 50,000 Ton Press. H. C. Hood. *Steel Processing,* v. 39, Dec. 1953, p. 642-646, 670.

Design, construction, transportation and erection. Diagrams, photographs. (T5)

49-T. More Life for Big Guns. W. C. Longstreth. *Steel Processing,* v. 39, Dec. 1953, p. 664-666.

Heat treating process designed to maintain accuracy and extend life of gun. Photographs. (T2, J general)

50-T. Materials for Central Station Pumps. J. B. Godshall. *Corrosion,* v. 10, Jan. 1954, p. 21-24.

Corrosion-erosion in feed pumps has been substantially eliminated by changing to resistant materials, particularly steels containing 5% or more of chromium. Micrographs. (T29, R1, AY)

51-T. Some Recent Developments in Aluminum Foil Packaging of Foods. J. M. Fultz. *Food Technology,* v. 8, Jan. 1954, p. 19-21.

Composition, manufacture and applications. Photographs. (T10, Al)

52-T. Light Alloy Bodies for Road Haulage Vehicles. *Machinery Lloyd (Overseas Ed.),* v. 25, Dec. 19, 1953, p. 100-102.

Advantages of aluminum alloy in construction of commercial vehicles. Diagrams. (T21, Al)

53-T. Alphabetical List of Some of the More Common Refinery Alloys and Steels. V. W. L. Nelson. *Oil and Gas Journal,* v. 52, Jan. 4, 1954, p. 100.

Data sheet. (T29)

54-T. Aluminium for Prefabrication. *Overseas Engineer,* v. 27, Jan. 1954, p. 212-213.

Versatility of light alloys in non-traditional construction. Mobility, ease of delivery and erection, adaptability and attractive appearance of units. Photographs. (T26, Al)

55-T. Low Inertia Flywheel Design Using New Materials. J. R. Harkness. *Precision Metal Molding,* v. 12, Jan. 1954, p. 50, 52.

Aluminum die casting and a magnet have reduced weight and improved performance of flywheel for a power lawnmower. Photograph. (T10, Al)

56-T. Etching Magnesium for Photoengraving. H. E. Swayze. *Printing Equipment Engineer,* v. 84, Dec. 1953, p. 84-85, 143.

Abstract of address delivered before American Photoengravers Convention, Boston, Oct. 1953. Development of magnesium as an engraving metal. Various factors affecting its use. Photographs. (T9, Mg)

57-T. (English.) **High Carbon Wire for Prestressed Concrete.** *Aciers Fins & Spéciaux Francais,* 1953, no. 15, Nov., p. 43-46.

Use of steel wire specially designed for requirements of prestressed concrete. Photographs. (T26, ST)

58-T. (Dutch.) **Discussion on Semiconducters.** *Bedrijf en Techniek,* v. 8, no. 189(24); Electronica section, v. 6, no. 136, Nov. 21, 1953, p. 189.

History and production of germanium by reduction from its compounds. (T1, Ge)

59-T. (German.) **Old and New Uses of Zinc.** K. Bayer. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 838-842.

Various uses of zinc and zinc alloys. Photographs, tables. 11 ref. (T general, Zn)

60-T. (German.) **The Storage-Battery Industry.** D. Evers. *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 881-885.

Design and uses of different types of storage batteries. Required quality of lead used in storage batteries and salvaging of old batteries. Photographs. (T1, A8, Pb)

61-T. (Hungarian.) **Evaluation of Aluminum-Base Bearing Metals From a Metallographic Point of View.** Zoltan Buray. *Aluminium (Budapest),* v. 5, no. 10, Oct. 1953, p. 216-220.

Properties necessary in bearing metals. Aluminum-bearing metals of various composition. Experiments in Hungary with aluminum-silver-lead alloy bearings. Tables, micrographs, graph. (T7, M27, SG-c, Al)

62-T. Wire Rope for the Steel Industry. A. J. Morgan. *American Iron and Steel Institute, Preprint,* Oct. 8, 1953, 8 p.

Paper presented at Chicago Regional Technical Meeting of AISI, Oct. 8, 1953. (T7, D general)

63-T. Metallurgical Aspects of Chain Manufacture. J. Waring. *Australasian Engineer,* 1953, Nov., p. 52-58.

Welding, casting, and forging problems in manufacture of various types of chains. Graphs, photographs, micrographs, diagram, tables. 27 ref. (T7, CN)

64-T. Selection of Permanent Magnet Materials. Charles A. Maynard. *Electrical Manufacturing,* v. 53, Jan. 1954, p. 114-119.

Influence of magnetic characteristics; application and design factors; material properties; and manufacturing methods in selecting best material from 19 types of cast, sintered, or formed materials now available. Graphs, tables, photographs. 16 ref. (T1, P16, SG-n)

65-T. For Al-Cu Connections—Pressed Aluminum Proves Best. Martin D. Bergan. *Electrical World,* v. 141, Feb. 1, 1954, p. 47-48, 50.

Laboratory tests and survey of utility experience show advantages when properly designed and installed over many other types of connectors. Graphs, photographs. (T1, Al)

66-T. Mold Irons for the Glass Industry. Newton Davis. *Glass Industry,* v. 35, Jan. 1954, p. 19-20.

General requirements and effect of alloying elements. Describes five types. Micrographs. (T29, CI)

67-T. Where to Use Tantalum. Tom M. Gayle. *Materials & Methods,* v. 39, Jan. 1954, p. 94-95.

Its properties make it desirable for corrosion resistant and electronic products. Photographs. (T general, Ta)

68-T. High Strength Low Alloy Steels in Transformer Equipment. M. M. Aronson. *Materials & Methods,* v. 39, Jan. 1954, p. 134-136.

Thinner sections of higher strength steels in transformer equipment reduce weight and ease shipping and handling problems. Photographs. (T1, AY)

69-T. You Can Use Aluminum Like Wood. Herb Pfister and Harry Walton. *Popular Science,* v. 163, Dec. 1953, p. 158-167.

A new use for aluminum is introduced, especially made for the household. Photographs, diagrams. (T10)

70-T. Electrolytic Capacitors. Emery Deutsch. *Radio-Electronics,* v. 25, Feb. 1954, p. 69-70.

A comparison of tantalum anode foils to aluminum is presented. Photographs, graphs. (T1, Al, Ta)

71-T. Aluminum Brightens Its Home Market. *Steel,* v. 134, Jan. 25, 1954, p. 58.

Increasing number of applications for aluminum. Photograph. (T10, Al)

72-T. Geometry of Wire Ropes. Frederico Hruska. *Draht (English Ed.),* 1953, no. 17, Dec., p. 29-32.

Different types of wire ropes are explained with aid of diagrams of their cross sections. Tables, diagrams. (T7)

73-T. (French.) **Application of Nodular or Spheroidal Graphitic Cast Iron for Rolling Mill Rolls.** M. Neuville. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* 1953, no. 12, p. 1937-1941.

Because of high strength and ductility after heat treatment, materials gave good results when used for rollers. (T5, Q general, CI)

74-T. (German and French.) **Copper in the Refrigeration Industry.** F. Hermann. *Pro-Metal,* v. 6, no. 36, Dec. 1953, p. 266-270.

Uses of tubes and connections. Photographs, diagram. (T27, Cu)

75-T. (German.) **Composition and Strength of Structural Steels for Bridges From the Period 1870-1880.** Ernest Hermann Schulz and Wilhelm Bischof. *Stahl und Eisen,* v. 73, no. 24, Nov. 19, 1953, p. 1583-1590.

Results reveal that puddled steel is unsatisfactory for bridge building. Bessemer steels were found to be better but still below present standards. Tables, graphs. 11 ref. (T26, Q23, CN)

76-T. (Russian.) **Practical Test of Hydroturbines With Carbon Steel Vanes.** S. S. Astaf'ev and G. A. Bronovskii. *Vestnik Mashinostroeniia,* v. 33, no. 9, Sept. 1953, p. 24-27.

Operation of turbine and composition of steel. Tables, micrograph, photographs, diagram. (T25, CN)

77-T. Strap Steel for Prestressed Concrete Structures. K. P. Milbradt. *American Concrete Institute, Journal,* v. 25, Jan. 1954, p. 357-363; *ACI Proceedings,* v. 50, 1954, p. 357-363.

New type of prestressing steel offers possible economy in this type of construction. Graphs, photographs, diagrams. (T26, CN)

78-T. New Honeycomb Processing Method. Frank Charity. *Machine and Tool Blue Book,* v. 49, Feb. 1954, p. 156-160, 162.

Process used by an aircraft industry. Photographs. (T24)

79-T. Aluminum Tubing and Pipe. *Modern Metals,* v. 9, Jan. 1954, p. 46, 48-49.

Markets and new welding method. Photographs. (T general, K6, Al)

80-T. Designing Magnesium Products. W. Z. Jarmicki. *Modern Metals,* v. 9, Jan. 1954, p. 54, 56, 58, 60.

Possibility of reducing cost of mag-

nesium products with intelligent application of its properties in design. Diagrams. (T general, Mg)

81-T. The Growing Promise of Titanium. Julius J. Harwood. *Research Reviews, Office of Naval Research,* Dec. 1953, p. 1-7.

Summary of uses of titanium. Photographs, graph. (T general, Ti)

82-T. (French.) **Large Tanks of Aluminum. The Production of Polystyrene by the Ribecourt Factory.** *Revue de l'Aluminium,* v. 30, no. 205, Dec. 1953, p. 431-433.

Use of aluminum and aluminum alloys for tanks and bins used in production of polystyrene. Photographs. (T29, Al)

83-T. (French.) **After the Le Bourget and Farnborough Exhibitions. Aviation 1953.** Jean Guillemin. *Revue de l'Aluminium,* v. 30, no. 205, Dec. 1953, p. 435-476.

Includes "The Era of Helicopters"; "Present-Day Airplanes, and Construction Techniques"; "Some Aerodynamics"; "Engines and Reactors"; "Equipment and Materials"; "Light and Ultra-Light Alloys"; "Materials for Parts and Alloys of the Future"; "Ministry of Supply and Secretariats of State"; and "'Brief Conclusions". Photographs, tables, diagrams, graphs. (T24)

84-T. (Book.) **Materials for Product Development.** 265 p. 1953. Clapp and Poliak, 341 Madison Ave., New York. $7.50.

Consists of 18 papers presented at the First Basic Materials Conference. Subjects include economics of engineering materials; high strength with low weight; high and low-temperature service; atomic energy; electrical and electronic service; materials selection and specification; and coordination in selection of materials. (T general, S22, A4)

85-T. (Book.) **Metallurgy and Construction.** E. M. H. Lips. 250 p. 1953. Elsevier Press, 402 Lovett Blvd., Houston 6, Tex.

For both metallurgist and designer, this volume brings study of metals into direct relationship with present-day construction techniques. (T26)

86-T. (Book—German.) **(Handbook of Cermet Tools) Handbuch der Hartmetallwerkzeuge. v. I; Herstellung und Anwendung von Dreh und Hobelwerkzeugen.** W. Dawihl and E. Dinglinger. 237 p. 1953. Springer-Verlag, Berlin, Germany. 15.60 DM.

Cemented carbide tools, their manufacture and effective use. (T6, C-n)

87-T. Jet Metals. William P. Brotherton. *Aero Digest,* v. 68, Feb. 1954, p. 40, 42, 44, 46.

New demands speed up search for alloys to meet jet-age needs. Reviews present applications. Photograph, graph. (T25, SS, Cr, Ni, Mo)

88-T. Metals Versus Plastics. Opening Contribution. S. Heslop. **Metals Versus Plastics. Contribution.** A. A. Tomkins. *Birmingham Metallurgical Society, Journal,* v. 33, Sept. 1953, p. 119-137.

The pros and cons of each material. Tables. 12 ref. (T general)

89-T. Magnesium for Electronics and Electrical Applications. *Magnesium,* 1954, Feb., p. 1-7.

In a steadily growing number of uses, no other metal can do the job as well. Photographs, diagrams. (T1, Mg)

90-T. Performance Evaluation of a Magnesium Alloy Truck Wheel. Marvin H. Polzin. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 65-80.

Advantages of magnesium over steel, use of stresscoat and strain gages to locate and measure strains on the wheel during actual truck maneuvers, fatigue analysis and performance evaluation and relative merits of testing-to-failure methods and experimental stress analysis techniques. Photographs, diagrams, graphs. 15 ref. (T21, Q25)

91-T. Adaptation of Materials Selection Criteria to the Design of Reactor Core Components. J. P. Frankel. Paper from "Conference on Nuclear Engineering, 1953 Proceedings". University of California, p. E1-E10.

Importance of thermal stress in addition to stress induced by load-carrying requirements of nuclear reactor components makes design difficult. Graph. 3 ref. (T25)

92-T. Metals for Reactor-Core Construction. Henry A. Saller. Paper from "Conference on Nuclear Engineering, 1953 Proceedings". p. 11-21. Sept. 9-11, 1953. University of California, Berkeley, Calif.

Status of various reactor materials are considered under classifications of fuels, cladding and structural materials, moderators and control materials. Tables. 16 ref. (T25)

93-T. (German.) **Cable With Pressed Aluminum Casing.** *Metall,* v. 8, nos. 1-2, Jan. 1954, p. 32-33.

Successful replacement of lead by aluminum as cable jackets. Mechanical properties of aluminum jackets. Table, graph, photographs. (T1, Q general, Al, Pb)

94-T. (Italian.) **Applications of Copper.** P. Lombardi. *Metallurgia italiana,* v. 45, Oct. 1953, p. 374-386.
Application for special conductors, various alloys and powder metallurgy. Diagrams, graphs, tables. (T general, Cu)

95-T. Effects of Methods of Manufacture and Steel Specifications on the Service of Disks. I. F. Reed and W. F. McCreery. *Agricultural Engineering,* v. 35, Feb. 1954, p. 91-94, 97.
Study indicates that manufacturers of disks should increase carbon content of their carbon steel disks to SAE 1085 or 1090 and heat treat to obtain hardness in range of Rockwell C-42 to 44. Photographs, tables, graphs. 4 ref. (T3, CN)

96-T. Prevention of Babbitt Blisters in Thrust-Bearing Pads. R. A. Baudry, D. W. Gunther and B. B. Winer. *ASME, Transactions,* v. 76, Feb. 1954, p. 255-260; disc., p. 260.
Investigation of processes to be used in manufacture of thrust-bearing pads that result in complete elimination of babbitt blistering. Photographs, diagrams, graphs. 15 ref. (T7)

97-T. Design of Steam Piping and Valves for 1100° F. F. A. Ritchings and Sabin Crocker. *ASME, Transactions,* v. 76, Feb. 1954, p. 261-271; disc., p. 271-277.
Reviews existing data. Speculates as to whether low-alloy ferritic steels could be made to serve the purpose. Graphs, tables. 34 ref. (T27, SS)

98-T. Titanium Outlook. Englebert Kirchner. *Aviation Age,* v. 21, Feb. 1954, p. 32-37.
Survey on titanium brings together opinions on aircraft usage held by airframe, engine and power-plant manufacturers. Photographs, charts. (T24, Ti)

99-T. American Applications of Boron and Other Low-Alloy Steels. H. B. Knowlton. *Iron and Steel Institute, Journal,* v. 176, Feb. 1954, p. 187-205; disc., p. 205-216 + 3 plates.
Presented at special meeting on "Boron in Steel", Iron and Steel Institute, April 1953, London. Graphs, tables, micrographs, diagrams. 27 ref. (T general, AY)

100-T. High Performance Jet Engine Design Dependent Upon Metallurgical Ingenuity. I. Perlmutter. *Journal of Metals,* v. 6, Feb. 1954, p. 113-118.
Use of metal alloys in aircraft turbine design. Tables, photographs, graphs, diagram. 4 ref. (T25)

101-T. Designing for Wear Resistance With Cemented Carbides. F. J. Lennon, Jr. *Machine Design,* v. 26, Feb. 1954, p. 176-179.
Carbide uses for machine components requiring wear resistance. Photograph. (T7, H general, Q9, C-n)

102-T. Stainless Steel Powder Magnetic Clutches. Alvin S. Weiss. *Product Engineering,* v. 25, Feb. 1954, p. 142-145.
Specialized application of a dry powder magnetic particle clutch utilizing stainless steel powder. Graph, table, photograph, diagram. 9 ref. (T7, H general, SS)

103-T. Concrete and Steel. R. F. Galbraith. *Times Review of Industry (Supplement),* 1954, p. 51-52.
Recent developments in technique of using these basic materials have caused significant changes in structural engineering practice. Photographs. (T26)

104-T. Discussion on Precision Spring Design. I. M. Gerard Fangemann. *Wire and Wire Products,* v. 29, Feb. 1954, p. 152-157, 207-209.
Results of experimental research. Basic spring design equations for main types of springs, including extension, compression, spiral, torsion and form springs. Table, diagrams, graph. (T7, Q general)

105-T. Steels for the Refractory and Heavy Clay Industries. G. W. Miles and W. B. Keith. *Edgar Allen News,* v. 33, Feb. 1954, p. 28-30.
Steels used in manufacture of brick molding machines. Micrographs, tables, photograph. (To be concluded.) (T29, ST)

106-T. High Strength Low Alloy Steel Railroad Cars Last Longer. J. W. Crossett. *INCO,* v. 26, no. 3, p. 4-6.
Includes photographs, table, graph. (T23, AY)

107-T. Chain for a Life Line. *INCO,* v. 26, no. 3, p. 16-17.
It is concluded that austenitic nickel-manganese steel machines at approximately twice the cost of nickel-chromium-molybdenum steel used for making nonmagnetic anchor chains. Photographs. (T7, G17, SS)

108-T. New Heat-Resistant Carbide May Increase Power of Jet Engines. *INCO,* v. 26, no. 3, p. 11, 26-27.
Kentanium may become the answer in search for a material superior to "super alloys" currently used in jet aircraft and gas-turbine engineering. Photograph. (T25, H general, Ti, C-n)

109-T. High Alloy Castings in Heat Treating Equipment. *INCO,* v. 26, no. 3, p. 12-13, 28-29.
High-alloy castings resist high-temperature conditions, reduce costs and prevent breakdowns. Photographs. (T5, J general, SG-h)

110-T. (French.) **Facing Buildings With Stainless Steel and Other Metals.** P. M. Slater. *Ossature metallique,* v. 18, no. 12, Dec. 1953, p. 616-620; disc., p. 620-622.

Presented at International Congress of Information Centres on Steel at Brussels. New method of constructing tall buildings with face lining of sheet steel. Economic aspects. Photographs, diagrams. (T26, SS)

111-T. (French.) **Cellular Bulkhead Structures of Steel Plate Piling.** L. Descans. *Ossature metallique,* v. 19, no. 1, Jan. 1954, p. 33-46.

Study of stresses in circular walls. Diagrams, graphs. 18 ref. (T26, Q25, ST)

112-T. (German and French.) **Light Metal in the Graphic Arts.** H. Marti. *Aluminium Suisse,* v. 3, no. 6, Nov. 1953, p. 200-201.

Use and advantages of aluminum furniture and base slugs in printing shops. Photographs. (T9, Al)

113-T. Steel and Titanium Alloy Extruded Shapes in Modern Aircraft. Keith A. Wilhelm. *Automotive Industries,* v. 110, Mar. 15, 1954, p. 266 + 11 pages.

Aircraft structures and applications of hot extruded ferrous and titanium alloys. Graphs, diagrams, charts. (T24, F24, AY, Ti)

114-T. Improved Transformer Design. *Canadian Metals,* v. 17, Mar. 1954, p. 20, 22, 24-25.

Transformers produced in a recently enlarged Canadian plant were redesigned, using a steel with oriented grain, to make a smaller, more efficient unit. Photographs. (T1, SG-p)

115-T. The Role of Aluminum as a Special Fuel. G. M. Babcock and F. B. Rethwisch. *Engineering and Mining Journal,* v. 155, Mar. 1954, p. 84-86.

Ability of aluminum to reduce oxides of iron, chromium, calcium, magnesium and carbon makes it extremely valuable when used as combined fuel and reducing agent in thermit welding and other chemical reduction processes. Photographs. (T29, T5, K4, Al)

116-T. Copper Tube for Piping Systems. Doremus L. Mills. *Heating, Piping & Air Conditioning,* v. 26, Mar. 1954, p. 129-131.

Characteristics and uses of various types. Tables, graph. (T27, Cu)

117-T. Ductile Iron: Makes Good on Tough Jobs. G. S. Farnham and Benton Dixon. *Iron Age,* v. 173, Mar. 18, 1954, p. 133-137.

Ductile iron's combination of toughness, impact resistance, machinability and good wear qualities have made it a preferred material for many of industry's toughest applications. Photographs. (T general, Q general, CI)

118-T. Liquid-Metal Heat Transfer. H. F. Poppendiek. Paper from "Heat Transfer Symposium", University of Michigan Press. p. 77-100.

"Liquid-metal heat transfer" refers to free and forced convection, and boiling heat transfer systems where the fluids are liquid metals. List of metals that may be used as heat transfer media. Differences between properties of the metals and ordinary fluids which significantly influence heat transfer are considered. Graphs, tables. 41 ref. (T general, P11)

119-T. (French.) **Cellular Bulkhead Structures of Steel-Plate Pilings. Detailed Study of Stresses of Circular Walls.** L. Descans. *Ossature metallique,* v. 19, no. 2, Feb. 1954, p. 77-84.

Vertical bending of pilings and possible consequences of poor construction. Photographs, graphs, tables, diagram. (T26, ST)

120-T. (Norwegian.) **Building Constructions of Steel. Brief Account of the Proposal for Revising NS 424.** Arne Selberg. *Teknisk Ukeblad,* v. 101, no. 7, Feb. 18, 1954, p. 133-138.

Proposed modernization of Norwegian standard. Graphs and tables on mechanical properties of different structural steels. (T26, S22, Q general, ST)

121-T. Wire Nails. G. G. M. Carr-Harris. *Canadian National Research Council, Technical Information Service Report no.* 34, Jan. 1954, 14 p.

Characteristics and methods of manufacture. 44 ref. (T7)

122-T. Materials. Aluminum Has Advantages for Tanks and Pressure Vessels. *Iron Age,* v. 173, Mar. 4, 1954, p. 174-176.

Lightness, corrosion resistance, nontoxicity and good thermal properties are advantages for design and fabrication. Diagrams. (T25, Al)

123-T. Where Pearlitic Malleable Irons Can Be Used to Advantage. Carl F. Joseph. *Materials & Methods,* v. 39, Mar. 1954, p. 100-101.

Stronger than standard malleable and approaching the properties of forgings, this versatile material is competing favorably with other metal forms in the automotive, ordnance, aircraft and other industries. Table, photographs. (T general, CI)

124-T. Materials & Methods Manual No. 103. Sandwich Materials. Kenneth Rose. *Materials & Methods,* v. 39, Mar. 1954, p. 117-132.
Core and facing materials and structural strength, insulating and special purpose laminates. Photographs, tables, graphs, diagrams. (T26)

125-T. Etchings and Nameplates. J. S. Mertle. *Photoengravers Bulletin,* v. 43, Mar. 1954, p. 5-36.
Developments and procedures for various metals, nonmetals, plastics and glass. (T9, Al, Cu, Mg, Ni, ST)

126-T. Success of a Carbide Tool Depends Upon Shank Selection. M. L. Backstrom. *Tooling and Production,* v. 19, Mar. 1954, p. 50-53, 161.
Quite often improper selection of tool body or shank material is responsible for detrimental tool performance, rather than carbide grade or machine tool upon which failure is usually blamed. Photographs, tables, graph. (T6, TS)

127-T. Steel Tubes for the Chemical Industry. W. E. Smith. *Chemical Age,* v. 70, Mar. 13, 1954, p. 617-621.
Manufacture of pipes for chemical handling problems. Photographs. (T29, F26, ST)

128-T. Design Requirements of Relay Core Materials. J. P. Martin. *Electrical Manufacturing,* v. 53, Apr. 1954, p. 138-141.
Crux of relationship of desired magnetic characteristics of materials to design factors lies in air-gap ratio. Photographs, graphs, table. (T1, P16)

129-T. Sleeve Bearing Application Factors. R. H. Josephson. *Electrical Manufacturing,* v. 53, Apr. 1954, p. 142-148.
Sleeve bearings now carry heavier loads at higher speeds and higher temperatures for longer periods of time. Defines demands put on bearings and how thin-wall insert bearing has met them. Diagram, graphs, tables, micrographs. (T7)

130-T. Germany Chooses Aluminum for Overhead Lines. T. Volgelsang. *Electric Light and Power,* v. 32, Mar. 25, 1954, p. 192-198.
Economic relationship between various metals for low, medium and high-voltage lines. Tables, graphs, diagrams, photographs. 2 ref. (T1, Al, Cu, ST)

131-T. Manufacture and Testing of Germanium Triodes. *Machinery Lloyd (Overseas Ed.),* v. 26, Mar. 13, 1954, p. 81, 83-87.
Characteristics, construction and precautions. Photographs, diagrams. (T1, Ge)

132-T. Magnesium in Airborne Radar Systems. *Modern Metals,* v. 10, Mar. 1954, p. 36-37.
Widest possible use of magnesium in castings, structural weldments and formed sheet metal. Photographs. (T1, Mg)

133-T. Alibag for Selling Motor Oil. *Modern Metals,* v. 10, Mar. 1954, p. 38.
One-piece impact extruded aluminum container that looks like a cross between a can, bag and package. Photograph. (T10, Al)

134-T. Colorful Aluminum Yarn. *Modern Metals,* v. 10, Mar. 1954, p. 40, 42.
Tells how Metlon, a thin ribbon of aluminum foil coated on both sides with colored acetate, is made and how it is promoted. Photograph. (T10, Al)

135-T. Alumaroll Awnings. *Modern Metals,* v. 10, Mar. 1954, p. 78-79.
Made of aluminum, they roll up and down like canvas. Photographs. (T26, Al)

136-T. Mold Irons and the Glass Mold Situation. E. R. Flatter. *American Ceramic Society, Bulletin,* v. 33, Apr. 1954, p. 101-103.
No one type of mold iron meets requirements for all applications. Recent development of nodular type graphite iron gives indications of solving more critical glass mold problems. (T29, CI)

137-T. A Tungsten Resistance Thermometer. F. R. Sias, J. R. MacIntyre and A. Hansen, Jr. *Communication and Electronics,* 1954, Mar., p. 66-69.
Performance of successful tungsten resistance thermometer calibrated and adjusted by a unique method. Graphs, diagrams, photograph. 2 ref. (T8, S16, W)

138-T. Aluminium-Alloy Headless Rivets Lower Up-Setting Loads Required. D. A. Barlow. *Engineering,* v. 177, Mar. 26, 1954, p. 398-399.
Tests on driving behavior, shear strength and tensile strength. Photographs, tables. 5 ref. (T7, Q23, Al)

139-T. How Engineers Select Metals for Oil-Film Bearing Applications. E. B. Etchells. *General Motors Engineering Journal,* v. 1, Mar.-Apr. 1954, p. 20-25.
Requirements a bearing metal must meet and properties of the available metals. Tables, diagrams, photographs. 8 ref. (T7, SG-c)

140-T. New Alloy Widens Future for Aluminum in Pressure Vessels. John B. Campbell. *Materials & Methods,* v. 39, Apr. 1954, p. 97-101.
Higher design stresses make aluminum more competitive with other

materials where corrosion resistance or lack of product contamination are important. Photographs, tables, graphs. (T26, Al)

141-T. **Where and How Thermostat Metals are Used.** Malcolm W. Riley. *Materials & Methods,* v. 39, Apr. 1954, p. 102-105.

Materials and principles involved in intelligent selection of thermostatic controls. Drawings, tables. (T8, SG-a)

142-T. **Role of Beryllium in the Atomic Energy Program.** Robert E. Pahler. *Metal Progress,* v. 65, Apr. 1954, p. 86-91.

Condensed from paper presented at Beryllium Symposium ASM Meeting, Boston, Mar. 1954. Beryllium, of special interest for use in nuclear reactors, can serve as a moderator and reflector. Photographs, diagrams, table. 1 ref. (T25, Be)

143-T. **Lodestones and Magnets.** John Parina, Jr. *Metal Progress,* v. 65, Apr. 1954, p. 99-100.

Principle of production of permanent magnets is to obtain by alloying and heat treatment a finely divided precipitate throughout matrix which "keys" oriented structure, and furnishes great resistance to change in magnetic condition. (T8, P16, Fe, Ni, Co, SG-n)

144-T. **Three Ways to Use PMM Processes.** W. A. Broadley. *Precision Metal Working,* v. 12, Apr. 1954, p. 44-45, 124.

To build smaller and lighter generator, investment castings, die castings and sinterings are used. Photographs. (T25, E13, E15, H general)

145-T. **King-Size Cushioners.** *Steelways,* v. 10, Apr. 1954, p. 16-17.

Chart on how hot-wound and leaf springs are made. Drawings, photograph. (T7)

146-T. **Mower Power to You.** Ron T. Smith. *Steelways,* v. 10, Apr. 1954, p. 18-19.

Constant search for better steels yields power mower that cuts nails. Photographs. (T10, ST)

147-T. (French.) **Roofs With Self-Supporting Troughs.** *Revue de l'Aluminium,* v. 31, no. 207, Feb. 1954, p. 61-66.

Combination of materials, manufacturing process and technique of use makes self-supporting aluminum troughs an efficient solution to roofing problems. Photographs, diagrams. (T26, Al)

148-T. (German.) **The Design of Heavy Duty Aluminum Bus Bars for Electrolytic Plants.** K. Kaizik. *Aluminium,* v. 30, no. 3, Mar. 1954, p. 98-100.

Possibility of replacing copper bars by aluminum with welded copper contacts. Graph, diagrams. 2 ref. (T29, Cu, Al)

149-T. (German.) **Aluminum in High Frequency Equipment.** F. Martin. *Aluminium,* v. 30, no. 3, Mar. 1954, p. 101-106.

Physical properties and application in transmitting and receiving equipment. Photographs, tables, graphs. 9 ref. (T1, P15, Al)

150-T. (German.) **The Use of Anti-Friction Bearings in Ironworks From Maintenance Point of View.** Hans Ponnath. *Stahl und Eisen,* v. 74, no. 7, Mar. 25, 1954, p. 396-402.

Types of bearings and proper selection. Damage features as key to cause of failure. Photographs, diagrams, table. 4 ref. (T7)

151-T. **Rock-Drilling With Hard Metals.** E. J. Sandford and J. R. Wiles. *Alloy Metals Review,* v. 8, Mar. 1954, p. 2-7.

Developments in properties of hard metals and problems involved in use of carbide tipped rock drills including carbide tip, steel stem and joint between them. Photograph, graphs, micrographs. 3 ref. (T23, EG-d)

152-T. **Production and Use of Cast-Iron Pressure Pipe. BDSA Study.** *American Water Works Association, Journal,* v. 46, Apr. 1954, p. 377-382.

Using past years as guide, with benefit of several predictions by economic groups and experts for 1954 and later years, it is possible to project a pattern for 1954 and 1955. Graphs. (T4, CI)

153-T. **Electric Glass Furnace Uses Moly Electrodes.** *Chemical Engineering,* v. 61, May 1954, p. 136, 138.

Melting glass by passing electric current through it has proved economical. Remodeled furnace boasts greater flexibility, longer life expectancy. (T29, Mo)

154-T. **Castings Play Vital Role in Antibiotics.** E. A. Schoefer. *Chemical Engineering,* v. 61, May 1954, p. 244, 246.

High-alloy castings in production of terramycin, chloromycetin and penicillin safeguard product purity while standing up to high temperatures and pressures. Photographs, table. (T29, CI)

155-T. **High Alloy Castings in New Equipment Help Steel Industry Expansion.** *Industrial Gas,* v. 32, Apr. 1954, p. 3-5, 22-24.

New trends in soaking pits and reheating furnaces, furnace dampers, skid rails, sheet and bar annealing, wire mill applications and

metallic recuperators. Photographs, table. (T5, AY, CI)

156-T. High Alloy Castings Reduce Steel Plant Maintenance. *Iron and Steel Engineer,* v. 31, Apr. 1954, p. 132, 134, 137-138.

Individual applications illustrate in detail how cast high alloys meet new demands of steel industry. Photographs, table. (T5, CI)

157-T. Metallurgy in the Mechanical Spring Industry. III. Alloy Steel Wires. *Mainspring,* v. 15, Apr. 1954, 4 p.

Materials, processing techniques and desirable characteristics. Photograph. (T7, G general, AY)

158-T. Aluminum in the Dairy Industry. David Stussi. *Modern Metals,* v. 10, Apr. 1954, p. 34-36.

European dairies make wholesale use of aluminum for all equipment. Reviews trend. Photographs. (T3, Al)

159-T. Tellurium Alloy Lead Sheath for Power Cable. G. B. Shanklin and J. F. Eckel. *Power Apparatus and Systems,* 1954, no. 11, Apr., p. 294-300; disc., p. 300-304.

Tests on new alloy show more stabilized bending and creep properties than on existing cables. Allows wide latitude in heat treatment. Tables, graphs, photograph. 9 ref. (T1, Q3, Q5, Pb, Te)

160-T. Tool and Die Materials Forum. *Steel,* v. 134, Apr. 19, 1954, p. 140-146, 148.

Cost-conscious users are imposing new requirements. Stresses chemical and physical properties once considered insignificant, notable gains being made in higher-alloy, high-physical property steels and economy picture rounded out by new plastics for tools, dies, jigs, fixtures, gages, patterns and locating blocks. (T5, G17, TS)

161-T. Shaped Wire. A Problem Solver. Ray Warner. *Water & Sewage Works,* v. 101, Apr. 1954, p. 170-171.

Application to water and sewage equipment. Photographs. (T4, SS)

162-T. Production of an All-Aluminium Motor-Car Body. C. E. Slade. *Welding and Metal Fabrication,* v. 22, Apr. 1954, p. 124-130.

Advantages of high power to weight and strength-to-weight ratios, high resistance to corrosion and weathering and ease of handling in production. Various welding methods. Photographs. (T21, K general, Al, Mg)

163-T. Applications of Alloy High-Strength Steels in Welded Structures. Howard L. Miller and Arthur E. Wilkoff. *Welding Journal,* v. 33, Apr. 1954, p. 339-350.

Steel having a minimum yield point of 70,000 psi. was successfully used in design and fabrication of widely different types of equipment found in ordnance, transportation and mining fields. Photographs, diagrams, tables.

(T general, K general, AY)

164-T. Magnesium Ramp. *Welding Journal,* v. 33, Apr. 1954, p. 380.

Portable magnesium ramp facilitates loading and unloading of highway trailers from flat cars. Photograph. (T26, Mg)

165-T. Evaluation of Superheater Materials for High-Temperature Steam. Bela Ronay and W. E. Clautice. *Welding Journal,* v. 33, Apr. 1954, p. 199S-206S.

Experimental installation evaluates superheater materials in contact with steam at temperatures beween 1100 and 1500° F. Diagrams, tables, photographs, micrographs. (T25, SG-h)

166-T. (English.) **Steel Carcasses for Pneumatic Tyres.** *Aciers Fins & Spéciaux Francais,* 1954, no. 16, Feb., p. 58-61.

Development, requirements and advantages. Photographs. (T21, ST)

167-T. (German and French.) **Copper Roofs.** F. Schinacher. *Pro-Metal,* v. 6, no. 37, Feb. 1954, p. 296-303.

Use of copper for eaves, spouts, roofs and trimming and replacing or repairing of deteriorated materials with copper sheet. Photographs. (T26, Cu)

168-T. (Russian.) **Molybdenum-Less Steel for Cold-Forging and Tool Dies.** D. I. Kostenko. *Vestnik Mashinostroeniia,* v. 34, no. 3, Mar. 1954, p. 40-45.

Compares hardness, heat resistance and deformation of molybdenum and titanium steels. Results indicate molybdenum can be replaced with titanium in cold stamping and threading dies. Tables, graphs. (T5, Q general, TS)

169-T Basic Features of Good Piston Design. Frank Jardine. *Automotive Industries,* v. 110, May 1, 1954, p. 54-56, 106.

Data should aid engineers in future design. Graph, diagrams. (T21, Al)

170-T Steel Wire Ropes—Their Construction and Application. F. J. Hewitt. *Institution of Engineers &*

Shipbuilders in Scotland, Transactions, v. 97, pt. 6, 1953-54, p. 471-482; disc., p. 483-488.

Quality of wire used in rope making, construction and fabrication of ropes, lubrication and corrosion resistance in relation to service applications. Diagrams. (T7, CN)

171-T. (Book.) **Soft Magnetic Materials for Telecommunications.** C. E. Richards and A. C. Lynch, editors. 346 p. 1953. Pergamon Press Ltd., 242 Marylebone Road, London, N. W. 1, England. $9.00.

Consists of 35 papers from symposium held at the Post Office Engineering Research Station, Apr. 1952. Papers are individually abstracted. (T1, P16, SG-p)

172-T. (Book.) **Steel Pipes for Water, Gas, Sewage and Air.** Stewarts and Lloyds, Ltd., Brook House, Upper Brook St., London, W. 1, England. (No charge.)

Tables of dimensions, tolerances for all classes of steel pipes; special fittings suitable for conveyance of gases; fluids and solids in varying degrees of suspension. Also monographs on strength of steel pipes and on flow of liquids and gases along them. (T27, Q23, ST)

173-T. Piping, Pumps and Valves for Atomic Reactors. Alfred Amorosi. *Heating, Piping & Air Conditioning,* v. 26, May 1954, p. 140-144.

Radioactivity problems of high-pressure, water-cooled nuclear plants; their effects on material selection and design of components. Diagrams, graphs, tables. (T25)

174-T. Titanium Weldment Replaces Steel Mortar Baseplate. C. Hartbower. *Machinery,* v. 60, May 1954, p. 182-184.

Advantages of light weight and high strength. Tables, photographs. (T2, K general, Ti)

175-T. How Proper Materials Selection and Use Leads to Cost Reduction. *Materials & Methods,* v. 39, May 1954, p. 70-116.

Savings through design, form and materials; 135 case histories. Photographs, diagrams. (T general)

176-T. The Precious Metals Industry. L. B. Hunt. *Metal Industry,* v. 84, Apr. 30, 1954, p. 353-356.

Industrial applications of silver, platinum and the platinum metals. Photographs.

(T general, EG-c, Ag, Pt)

177-T. Materials for Large Army Gun Tubes. A History. I. Cast Iron. Peter R. Kosting. *Metal Progress,* v. 65, May 1954, p. 90-95, 152, 154.

Methods of casting and testing in 1800's. Diagrams, tables. 18 ref. (T2, CI)

178-T. Selection and Heat Treatment of Tool and Die Steels. I. Howard E. Boyer. *Modern Machine Shop,* v. 26 May 1954, p. 120-127.

General information for tool and process engineers and tool and die makers. Table, photographs. (To be continued.)

(T6, J general, TS)

179-T. All-Aluminum Gas Line Is Unique Installation. Bill Slocum. *Petroleum Engineer,* v. 26, May 1954, p. D48-D50.

Lightweight aluminum pipe used on 12-mile, 8-in. gas line is welded by new-type automatic welding machines. Method involves less equipment and manpower. Photographs. (T4, K1, Al)

180-T. Aluminum Alloys in Hopper Cars. E. T. Englehart and G. B. Hauser. *Railway Locomotives and Cars,* v. 128, May 1954, p. 62-66.

Appraisal of results obtained in 75 experimental cars of 11 owners and in different classes of service. Photographs, tables. (T23, Al)

181-T. Effecting Economies With High-Strength Steels. A. F. Stuebing. Paper from "Materials for Product Development 1953". Clapp & Poliak, p. 73-82.

Examples in many forms of heavy equipment. (T general, AY)

182-T. Materials for High-Temperature Service. Howard C. Cross. Paper from "Materials for Product Development 1953". Clapp & Poliak, p. 117-144; disc., p. 159-161.

Plastics in aircraft applications, progress of the newer metals, aluminum, titanium, chromium, molybdenum and ceramics. Graphs, tables. (T24, Al, Cr, Mo, Ti)

183-T. Materials and the Atomic Age. J. C. Robinson. Paper from "Materials for Product Development 1953". Clapp & Poliak, p. 162-170; disc., p. 170-172.

Review of secondary aspects and possibilities of U.S. A.E.C. work, especially with zirconium, hafnium and beryllium. (T25, Zr, Hf, Be)

184-T. Selecting Materials for Roller Bearings. Theodore Jagen. Paper from "Materials for Product Development 1953". Clapp & Poliak, p. 251-255.

Demands close cooperation between several management groups to improve and reduce cost of bearings. Permanent committee studies materials and methods. (T7)

185-T. (German.) **Aluminum in the Motorcycle.** Curt Bücken. *Aluminium,* v. 30, no. 4, Apr. 1954, p. 139-151.

Advantages of light weight, thermal conductivity and appearance. Photographs, diagrams, tables, graphs. (T10, Al)

186-T. 1.5 Per Cent Carbon Cast-Steel Railroad-Car Wheels. N. A. Matthews and R. A. Flinn. *ASME, Transactions,* v. 76, May 1954, p. 617-621.

Cast steel found superior to chilled iron for wheels subjected to severe operating conditions. Micrographs, diagram, tables. (T23, CI)

187-T. Magnesium's Advantages in Textbook Production. William I. Frisch. *Bookbinding & Book Production,* v. 59, May 1954, p. 80-81.

Objective evaluation of advantages of magnesium for publishers relying on single and multi-color letterpress. (T9, Mg)

188-T. The Theory of High Pressure Vessel Design. B. A. Finlay. *Chemical & Process Engineering,* v. 35, May 1954, p. 147-150, 155.

Mathematical principles on which design is based, application in practice. Graphs, tables. 12 ref. (T26)

189-T. Materials for Nuclear Reactors. Stuart McLain. *Chemical Engineering Progress,* v. 50, May 1954, p. 240-244.

Material choices for typical reactors. Tables. (T25)

190-T. Metals and Marine Engineering. S. F. Dorey. *Engineering,* v. 177, May 7, 1954, p. 589-590.

Applications of nonferrous metals. Considers corrosion, fatigue, bearing materials and fusion jointing. (T22, EG-a)

191-T. Maintenance Applications for Wire Thread Inserts. Howard O. Haas. *Industry and Power,* v. 66, May 1954, p. 91-93.

Engine cylinder heads and other costly parts with thread damage are easily put back into service. Photographs, table. (T7)

192-T. Steels for Steam Power Plant. A. M. Sage. *Institution of Mechanical Engineers, Proceedings,* sec. A, v. 167, no. 4, 1953, p. 414-424; disc., p. 424-433.

Effects of creep properties in different steels led to adoption of chromium-molybdenum, and chromium-molybdenum-silicon and, to a less extent, molybdenum-vanadium steel for superheater tubes, steam pipes and superheater headers for plant using temperatures above 900° F. Future developments outlined. Graphs, tables, micrographs. 16 ref. (T25, Q3, AY)

193-T. Precision Elements. C. F. Alban. *Instrumentation,* v. 7, no. 3, 1954, p. 33-35.

Design and uses of thermostatic bimetals. Photographs. (T8, SG-a)

194-T. Heavy Metals. Don Wackerle. *Machine Design,* v. 26, May 1954, p. 143-147.

Uses and fabrication of high-density alloys by powder metallurgy. Photographs, graphs, table. (T general, H general, W, Ni)

195-T. Temperature-Compensator Alloys. Warren S. Eberly. *Machine Design,* v. 26, May 1954, p. 152-156.

Provide automatic temperature correction of magnetic and electrical properties in instrumentation devices. Photograph, tables, graphs, diagram. (T8, P15, P16, Fe, Ni)

196-T. Designing With Aluminum. VII. Aluminum for Ducts. *Product Engineering,* v. 25, May 1954, p. 339-340.

Results in reduced heat and friction losses, good corrosion resistance and duct size reduction. Graphs. (T27, Al)

197-T. Cast Alloys Tops for Hot Spots. E. A. Schoefer. *Steel,* v. 134, May 24, 1954, p. 122-125.

Lists cast alloys or combinations of several that can handle any high-temperature job. Tables, photographs. (T general, SG-h)

198-T. Aluminium in Mining Equipment. *Times Review of Industry,* v. 8, new ser., May 1954, p. 26.

Possible sparking hazards investigated. Photographs. 2 ref. (T28, Al)

199-T. (French.) **Steel Radiators.** J. Reniers. *Ossature metallique,* v. 19, no. 5, May 1954, p. 257-270.

Production characteristics and application of section and panel radiators. Diagrams, photographs. (T27, ST)

200-T. (German.) **Materials for High Steam Temperatures.** K. Wellinger. *Brennstoff-Wärme-Kraft,* v. 6, no. 4, Apr. 1954, p. 144-145.

Application of special steels for boiler construction. Methods for determining their strengths at wall temperatures above 575° C. Graph. 19 ref. (T25, Q23, ST)

201-T. (German.) **Aluminum as a Material in Modern Bridge Building.** W. Bleicher. *Metall,* v. 8, nos. 9-10, May 1954, p. 358-362.

Mechanical properties of Al-Mg-Si alloy. Photographs, diagrams. 7 ref. (T26, Q general, Al)

202-T. Problems in Developing Alloy Steels for Aircraft Gas Turbines. F. L. Ver Snyder. *Iron and Steel Engineer,* v. 31, May 1954, p. 115-123; disc., p. 123.

High temperatures bring need for new products. Diagram, photomicrograph, graphs, tables, photographs. 13 ref. (T25, SG-h)

203-T. Materials for Large Army Gun Tubes. A History. II. Wrought Iron and Brass Cannon. Peter R. Kosting. *Metal Progress,* v. 65, June 1954, p. 91-95.

Methods of casting and testing in 1800's. Table, diagrams. (T2, Cu, Fe)

204-T. Aluminum Everywhere. *Metal Progress,* v. 65, June 1954, p. 113-114.

Autoradiography in aluminum metallurgy. Construction of new Alcoa building. Photographs. (T26, M23, Al)

205-T. Use Silver for Current Carrying Switchgear Contacts and Joints. E. M. Troischt and T. J. Connor. *Plant,* v. 9, June 1954, p. 39-43, 90.

Methods of applying silver, essentials of satisfactory contacts and recommendations for protection and proper maintenance. Photographs. 8 ref. (T1, Ag)

206-T. The Challenge of Design in Airframe Development. P. Litherland Teed. *Shell Aviation News,* 1954, no. 190, Apr., p. 6-9.

Task of metallurgist in materials development for future aircraft. Tables, graphs. (T24)

207-T. Building Products Firm Develops New Machines, Uses for Aluminum. Howard E. Jackson. *Western Metals,* v. 12, May 1954, p. 61-63.

Evolution of aluminum building products. Photographs. (T26, Al)

208-T. (Book.) **Bulbed and Lipped Structural Aluminium Alloy Sections (Angles and Channels).** Addendum to Application Brochure No. 6. Aluminium Development Assn., 33 Grosvenor Street, London W. 1, England.

Compares recommended strut curve with Perry curve for channel sections. Data on equal and unequal bulb angles and channels. (T26, Al)

209-T. (Book.) **Fully Supported Aluminium Roof Covering.** Applications Brochure No. 9. 32 p. 1953. The Aluminium Development Association, 33 Grosvenor Street, London W.1, England. 2s 6d.

Appropriate materials in relation to British Standards applying to sheet and strip; wire and bars; and rods and sections. (T26, Al)

210-T. (Book—German.) **(Plain Bearings.) Gleitlager.** E. Schmid and R. Weber. 394 p. 1953. Springer-Verlag, Berlin. 45 DM.

Theory of bearings and bearing testing. Metallic and nonmetallic materials, properties, recommendations, and applications for specific purposes. (T7)

211-T. Your Product: How Light? How Small? How Compact? Alex E. Javitz. *Electrical Manufacturing,* v. 53, June 1954, p. 89-108.

Weight saving, space reduction and small size are challenges for engineer. Solutions vary from design principles, materials, components, fabrication and production techniques. Photographs, tables. 25 ref. (T general)

212-T. Hangar Doors of Aluminum Alloy. *Engineering,* v. 177, May 21, 1954, p. 658-659.

Construction of folding and sliding doors at London airport. Photographs, diagrams. (T26 Al)

213-T. Aluminum Die Castings in Telephone Equipment. L. Pederson. *Materials & Methods,* v. 39, June 1954, p. 98-100.

Economic, engineering and production factors. Photographs. (T1, Al)

214-T. Cast High Alloys for Heat Treating Equipment. *Metal Treating,* v. 5, May-June 1954, p. 6-7, 18.

Some applications, alloy selection and design. Photographs, diagrams, table. (T5, CI)

215-T. Evaluation of Test Data in Determining Minimum Design Requirements for Aluminum-to-Copper Connectors. D. C. Hubbard, R. W. Kunkle and A. B. Chance. *Power Apparatus and Systems,* 1954, no. 12, June, p. 616-625; disc., p. 625-628.

Design of various types of connectors. Plating requirements for corrosion protection. Tables, graphs, photographs. 15 ref. (T1, L17, Al, Cu)

216-T. Aluminium and Its Alloys in Industry. Packaging. J. A. Ambler. *Sheet Metal Industries.* v. 31, no. 326, June 1954, p. 538-539, 551 + 2 plates.

Uses of metal containers and foils. Photographs. (T10, Al)

217-T. Aluminium and Its Alloys in Industry. Aircraft Forgings. W. Morgan. *Sheet Metal Industries,* v. 31, no. 326, June 1954, p. 545-546.

Development of alloys, improvement in ingot and forging quality and reduction of residual stresses. Photographs. (T24, F22, Q25, Al)

218-T. Aluminium and Its Alloys in Industry. Electrical. C. H. E. Rid-

path. *Sheet Metal Industries,* v. 31, no. 326, June 1954, p. 548-550.

Good conductivity, lightness and resistance to corrosion offer good usage in transmission lines. Photographs. (T1, Al)

219-T. Die Steels for Cold Extrusion. E. Johnson and E. Bishop. *Steel Processing,* v. 40, June 1954, p. 353-360, 391.

Quality, heat treatment, hardness and hardenability, resistance to tempering, toughness, abrasion resistance, ease of machining and grinding. Tables, graphs, micrographs. 14 ref. (T5, G5, TS)

220-T. (English.) **A Comparative Study of Cutlery Steels Containing Different Percentages of Iron Derived From Iron Sand.** Sadao Koshiba and Mitsuo Kikuta. *Hitachi Review,* 1954, no. 5, Feb., p. 107-111.

Three types of cutlery steel tested to determine conditions of transformation, thermal expansion coefficients and hardenability, carbide spheroidizing and heat treatment characteristics. Tables, graphs, micrographs. (T8, SS)

221-T. (German.) **The Aluminum Body of the New Dyna-Pannard.** J. J. Baron. *Aluminium,* v. 30, no. 5, May 1954, p. 183-194.

Design, operation, and production methods. Tables, photographs. (T21, Al)

222-T. (German.) **Light Metal Containers.** K. Muschard. *Aluminium,* v. 30, no. 5, May 1954, p. 195-199.

Advantages of light weight, high strength, low damage to contents and open-air storage. Photographs. (T10, Al)

223-T. (German.) **Experiences With Chromium-Vanadium Economy Tube Steels.** W. Herrmann. *Energietechnik,* v. 4, no. 1, Jan. 1954, p. 24-25.

Defects on chromium-vanadium steel boiler tubes. Methods for handling and welding. Diagram, photograph, table. (T26, K general, AY)

224-T. (German.) **Ceramic-Metal Resistance Materials for Electrical Engineering.** Alfred Schulze. *Umschau in Wissenschaft und Technik,* v. 54, no. 10, May 15, 1954, p. 293-295.

Fields of application. Graphs, table. (T1, H general)

225-T. Penetration of Various Packaging Films by Common Stored-Product Insects. Paul D. Gerhardt and David L. Lindgren. *Journal of Economic Entomology,* v. 47, Apr. 1954, p. 282-287.

Tests of saran, pliofilm, polyethylene and metalplastic laminated films. Nontransparent laminated film containing aluminum foil as one of the laminae was respectively resistant to insect penetration but not insectproof. Photographs, tables. (T10, Al)

226-T. Atomic Age Develops New Uses for Light Metals. *Light Metal Age,* v. 12, June 1954, p. 12-13, 39.

Miscellaneous applications of beryllium, aluminum alloys and cermets in nuclear reactors. Diagrams. (T25, Be, Al, C-n)

227-T. Commercial Sand-Cast Magnesium Applications. R. M. Burns. *Light Metals,* v. 17, June 1954, p. 201.

Uses in logging trailers, sawmills, farm machinery, hand tools and mine hoists. Table. (T4, T3, T6, T28, Mg)

228-T. "Mechanical World" Flowsheet—No. 246. Germanium Rectifiers —Manufacture and Testing. J. Zeelander, compiler. *Mechanical World and Engineering Record,* v. 134, June 1954, p. 262-263.

Properties and uses of germanium diodes. Flowsheet, diagram, photographs. (T1, Ge)

229-T. Properties of Light Springs. B. Coates. *Metal Treatment and Drop Forging,* v. 21, June 1954, p. 284-288.

Physical and fatigue properties of spring steels. Specifications for nonferrous springs. Tables, diagram. (T7, SG-b)

230-T. Selection and Heat Treatment of Tool and Die Steels. III. Howard E. Boyer. *Modern Machine Shop,* v. 27, July 1954, p. 206 + 12 pages.

Applications for nine classes of toolsteels. Table, micrographs, graph. (T6, J general, TS)

231-T. Aluminum in Truck Body Construction. E. P. White. *Modern Metals,* v. 10, June 1954, p. 52, 54-56.

Aluminum offers substantial economies in terms of increased pay load and lower maintenance costs. Diagram, photographs, table. (T21, Al)

232-T. Metallic Staple—Can You Spin It? *Textile Industries,* v. 118, July 1954, p. 76-81.

Methods of spinning blends of metallic and cotton, wool or synthetic fibers. Photographs, table. (T10, Al)

233-T. (German.) **Monocrystals of Germanium for Production of Transistors.** H. Salow and A. Hähnlein. *Fernmeldetechnische Zeitschrift,* v. 7, no. 5, May 1954, p. 235-241.

Production, properties and use. Graphs, photographs, diagrams. 8 ref. (T1, Ge)

234-T. Metal Cans of the Future. R. H. Lueck, K. W. Brighton and R. W. Pilcher. *American Paint Journal,* v. 38, July 12, 1954, p. 22, 24, 26.

Alternates for tin plate, including untinned steel, specially treated steel, aluminum and steel coated with aluminum, zinc and possibly nickel. Brief comments on developments in coating and cementing. (T10, L general, Sn, ST, Al)

235-T. Liquid Metal for Power Reactors. *Chemical and Engineering News,* v. 32, July 12, 1954, p. 2772, 2774, 2776.

Liquid metal fuels appear best approach to competitive power reactor. Molten solution of U^{233} in bismuth looks promising for use as nuclear reactor fuel. (T25, U, Th)

236-T. (Czech.) **Production Technology of Bimetallic Strips for Thin-Walled Babbitt Bearings.** Vladimir Suchanek. *Hutnické Listy,* v. 9, no. 5, 1954, p. 280-288.

Production methods and results of various metal combinations. Adhesion of bimetallic components. Graphs, photographs, micrographs, diagrams. 25 ref. (T7, AY, Cu, Sb, Sn)

237-T. (Russian.) **Manufacture and Use of Iron-Graphite Bearings for Rollers of Coal Conveyers.** P. V. Semencha. *Vestnik Mashinostroeniia,* v. 33, no. 12, Dec. 1953. p. 66-69.

Production methods and wearing characteristics. Diagrams, graphs, micrographs. (T28, H general, Q9, Fe)

238-T. (Pamphlet.) **Aluminium and Its Alloys in Building.** 1953, 76 p. Aluminium Development Association, 33 Grosvenor Street, London, W. 1, England. 3S,6d.

Examples of structural and decorative uses. (T26, Al)

239-T. Tanker Heating Coils of Aluminium Alloy. Lightweight Corrosion-Free Installation. *Engineering,* v. 178, July 2, 1954, p. 28.

Details of installation of aluminum alloy coils in oil tanker. Diagram, photograph. (T27, Al)

240-T. The Manufacture and Properties of Automobile Suspension Springs. C. J. Dadswell, J. E. Russell and R. Fielding. *Machinery (London),* v. 84, June 18, 1954, p. 1297-1301; v. 85, July 2, 1954, p. 29-32.

Condensed from paper before Institute of Mechanical Engineers. Coil springs; torsion bars; laminated springs. Finishing and scragging treatment; testing and inspection. Photographs, tables. (T7, SG-b)

241-T. The White-Metalling Process. A. J. Gibbs Smith. *Machinery Lloyd (Overseas Ed.),* v. 26, July 3, 1954, p. 87, 89.

Methods employed for producing bearings for railway rolling stock. Photograph, diagrams. (T7, SG-c, Sn, Zn, Cu, Pb, Sb)

242-T. A Vapor Barrier of Laminated Mylar and Aluminum. James G. Macormack. *Refrigerating Engineering,* v. 62, July 1954, p. 58-60, 98, 100.

Polyester film provides flexible strength, aluminum foil provides moisture impermeability. Diagram, photographs, graphs. (T27, Al)

243-T. (French.) **Advantages of Taper Roller Bearings Applied to Roll Journals.** W. P. Snedden. *Revue universelle des mines,* v. 10, ser. 9, no. 6, June 1954, p. 242-249.

Assembling procedure and advantages of efficiency and economy. Diagrams, photographs. (T7, F23)

244-T. (French.) **Improvements in Aluminum-Tin Alloys for Plain Bearings.** J. W. Cuthbertson. *Revue universelle des mines,* v. 10, ser. 9, no. 6, June 1954, p. 250-257.

Fatigue resistance and wearing quality. Table, graphs, micrographs, photograph, diagram. (T7, Q7, Q9, Al, Sn)

245-T. (Italian.) **Aluminum Packaging for Fish Products.** G. Ciani. *Alluminio,* v. 23, no. 3, May 1954, p. 269-280.

Advantages and possibilities of standardization. Photographs. (T10, Al)

246-T. (Italian.) **Aluminum Jewelry.** *Alluminio,* v. 23, no. 3, May 1954, p. 287-292.

Characteristics of pure and alloyed aluminum. Reflecting power of electrochemically polished products. Photographs, tables. (T9, L13, Al)

247-T. Aluminum on Power Cables Forecast. Kenneth S. Wyatt. *Electrical World,* v. 142, July 26, 1954, p. 94-97.

Properties and processing characteristics of aluminum sheaths for electric power and communication cable. Graph, photographs, tables. (T1, Al)

248-T. Copper and Aluminum Making Inroads on Use of Lead in U.K. Building, Cable Sheathing Fields. S. Cahn. *Metals (Daily Metal Reporter Monthly Supplement),* v. 25, July 1954, p. 9-10.

Characteristics of aluminum and lead. Increase of usage in applications formerly monopolized by lead. (T26, T7, Al, Cu, Pb)

249-T. Installing and Avoiding Failures in Babbitt Bearings. *Metal-Working,* v. 10, Aug. 1954, p. 16-17.

Causes for bearing failure, selection of materials, melting, preparation for bonding and casting the liner. Tables. (T7, Sn, Pb)

250-T. Good Design in Aluminum Furniture. *Modern Metals,* v. 10, July 1954, p. 44, 46, 48.

Production demands and distribution. Photographs. (T10, Al)

251-T. Aluminum vs. Steel in Railroads, Automobiles, Ships. II. *Modern Metals,* v. 10, July 1954, p. 53 + 4 pages.

Comparison of properties for application to various rolling stock equipment. Tables, photograph. (T23, T21, T22, Al, ST)

252-T. Structural Uses for Aluminum Extrusions in Europe. Cedric Marsh. *Modern Metals,* v. 10, July 1954, p. 70-72, 74.

Application in heavy construction. Photographs. (T26, Al)

253-T. Aluminum Scaffolds. *Modern Metals,* v. 10, July 1954, p. 76-77.

Light, strong, safe and economical. Photographs. (T26, Al)

254-T. Progress in Metals. Application of Iron Castings and Low-Alloy Steels in Refining. W. L. Nelson. *Oil and Gas Journal,* v. 53, Aug. 2, 1954, p. 111-112.

Compositions, properties and uses. Table. (T29, CI, AY)

255-T. Metallurgical Problems in Nuclear Power Reactors. II. Design Considerations. Henry H. Hausner and John R. Bedell. *Sylvania Technologist,* v. 7, July 1954, p. 83-85.

Cladding of fuel elements, heat transfer to coolant, corrosion problems and radiation damage. Tables. 6 ref. (T25)

256-T. Marine Propellers—A Guide to the Literature on Design and Production. G. G. M. Carr-Harris. *Canadian National Research Council, Technical Information Service Report no.* 40, June 1954, 22 p.

Design and manufacture, pattern and mold making techniques, alloys and pouring procedures, gaging, machining and finishing. Diagrams, charts, table. 98 ref. (T22, E11, G17, L general, Cu)

257-T. Cutting Edge Lubricant Built-In. *Steel,* v. 135, Aug. 9, 1954, p. 116-117.

Sulfur added to toolsteels gives free machining and longer tool life. Photographs, graphs, micrographs. (T7, G21, TS)

258-T. Some Useful Applications of Zirconium. J. H. McClain and R. W. Nelson. *U. S. Bureau of Mines, Information Circular* 7686, June 1954, 7 p. + 21 plates.

Applications in laboratory and industrial equipment. Photographs. 9 ref. (T general, T8, Zr)

259-T. Structural Trends. The Use of Steel and Titanium-Alloy Extruded Shapes in Modern Aircraft. Keith A. Wilhelm. *Aircraft Production,* v. 16, Aug. 1954, p. 301-303.

Properties, hot extrusion, applications and needs for further study of high-heat steel and titanium alloys. Graphs, diagram. (T24, AY, Ti)

260-T. Case History Application of Aluminum Screw Machine Products. Theodore Chanoux. *Electrical Manufacturing,* v. 54, Aug. 1954, p. 86-88.

Aluminum alloy rod substituted for stainless steel, alloy steel and brass in a dictating machine. Photographs. 14 ref. (T10, Al, SS, AY, Cu)

261-T. Germanium—New Frontier for High Power Rectification. C. E. Hamann. *Product Engineering,* v. 25, Aug. 1954, p. 188-192.

Initial applications demonstrate significant advantages in higher cell ratings, lower losses, longer life, higher efficiency and marked cell size reduction. Photographs, graphs, diagrams. (T1, Ge)

262-T. (French.) **Germanium Semiconductors and Transistors.** C. Weill. *DOCAERO; revue documentaire de la technique aéronautique mondiale,* 1954, no. 28, p. 39-60.

Possible applications in aeronautical equipment. Diagrams, graphs, table, photographs. 20 ref. (T24, Ge)

263-T. Design and Manufacture of Track Layouts. IV. Docks and Works Sidings. T. Samson. *Edgar Allen News,* v. 33, Aug. 1954, p. 177-178.

Casting, heat treating and manufacture from steel strip. Photographs. (T22, T4, AY)

264-T. New Metals in Engineering. L. B. Pfeil. *Institute of Marine Engineers, Transactions,* v. 66, July 1954, p. 169-174 + 4 plates; disc., p. 175-181.

Metallurgical developments which bear on marine engineering. Properties and applications. Diagrams, tables, graphs, photographs, micrographs. 16 ref. (T22, Cu, Ni, CI, SG-h)

265-T. Custom Truck Bodies. Aluminum Makes Its Move. Robert E. S. Thompson. *Steel,* v. 135, Aug. 23, 1954, p. 100-101.

Advantages of aluminum; production sequence. Photographs. (T21, Al)

266-T. (Czech.) **Replacement of Nonferrous Metals by Nonmagnetic Steels.** Vl. Koran. *Slévarenstvi,* v. 2, no. 6, June 1954, p. 173-174.
Castability, machinability, weldability and impact strength are cited as advantages for many applications. Diagrams. (T general, SS)

267-T. (French.) **The Various Fields of Application.** *Revue de l'Aluminium,* v. 31, no. 211, June 1954, p. 201-272.
Uses of aluminum and its alloys in various industries. Photographs, drawings. (T general, Al)

268-T. Rock-Drilling With Hard Metals. III. E. J. Sandford and J. R. Wiles. *Alloy Metals Review,* v. 8, Sept. 1954, p. 2-8.
Manufacture, design and application of the hard metal tipped rock-drill. Photographs. 7 ref. (T7, EG-d)

269-T. Magnesium in Intercontinental Defense. *Magnesium,* 1954, Aug., p. 2-4.
Applications in guided missiles, communication equipment, and mobile units. Photographs. (T2, T1, Mg)

270-T. Automotive Alloys in U.K. and U.S.—a Comparison. *Light Metals,* v. 17, Aug. 1954, p. 253-261.
Designations, properties, composition, and applications of aluminum and magnesium alloys. Tables. (T21, Al, Mg)

271-T. Metallurgy in the Mechanical Spring Industry. V. Nickel Alloys. *Mainspring,* v. 15, Aug. 1954, 4 p.
Compositions, mechanical properties and applications. Diagrams, tables. 3 ref. (T7, Ni)

272-T. Where to Use Aluminum Alloys. W. L. Nelson. *Oil and Gas Journal,* v. 53, Aug. 30, 1954, p. 103.
Services in which aluminum alloys have been or are being used. Table. (T general, Al)

273-T. The Technique of Printing on Aluminum Foil. Kenneth M. Greenwell and E. C. Leonard. *Paper, Film and Foil Converter,* v. 28, Sept. 1954, p. 21-25.
Inks, press techniques, cutting methods. Photographs, diagrams. (T9, Al)

274-T. (French.) **Practical Use of Steel Regenerators in Metallurgical Furnaces.** J. Faure. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 327 + 5 pages.
Characteristics and uses. Comparison with refractory types. Diagrams, photographs. 11 ref. (To be continued.) (T5, ST)

275-T. (German.) **Aluminum in Automobile Construction.** *Aluminium Ranshofen, Mitteilungen,* v. 2, no. 1, June 1954, p. 16-18.
Aluminum alloys for engines, pistons, piston rods, bearings, coolers, bodies and other parts. Photograph. (T21, Al)

276-T. (German.) **Platinum Metals in New Laboratory Equipment.** H. Speidel. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 599-600.
Methods of modifying mechanical and physical properties, mainly by alloying. Applications. Micrographs, graph, photographs. (T8, EG-c)

277-T. (Russian.) **Some Conclusions From an Analysis of the Operation of Three-Fluted Drill Bits.** L. P. Konstantinov and A. S. Mokshin. *Neftianoe Khoziaistvo,* v. 32, no. 7, July 1954, p. 23-27.
Comparison of different steels used in bits. Types of drills adapted to different rock types. Graphs, tables. (T7, ST)

278-T. (Book.) **Elementary Tool Design.** Elmer B. Benson. 224 p. 1954. Chas. A. Bennett, 237 No. Monroe St., Peoria 3, Ill. $4.76.
Selection of materials; interpretation of tooling requirements; design of jigs, fixtures, and dies for cutting, forming, and multiple-operations; and estimation of tool costs. (T6)

279-T. Current Development of Aircraft Production Processes. J. V. Connolly. *Aircraft Engineering,* v. 26, Sept. 1954, p. 272-287, 291.
Survey of developments of recent years and techniques likely to become important in the future. Diagrams, tables, photographs. (T24)

280-T. Progress in Magnesium Plates. Keith Johns. *Bookbinding & Book Production,* v. 60, Sept. 1954, p. 67-69, 72.
Advantages, costs and applications of magnesium printing plates. Photographs. (T9, Mg)

281-T. Marine High Duty Cast Iron Replaces Steel. E. C. Pigott. *Iron & Steel,* v. 27, Sept. 1954, p. 441-445.
Factors influencing selection and foundry procedure for gray iron in steam lines. Photographs, tables, graphs. (T22, E general, CI)

282-T. The Use of Light Metals in Naval Design. Roy E. Scherman. *Light Metals,* v. 17, Sept. 1954, p. 300-301.
Applications in Swedish Navy. (T22, Al)

283-T. Some Current Applications of Powder Metallurgy. *Machinery (London),* v. 85, Aug. 13, 1954, p. 328-330.

Nonferrous and ferrous bushings, washers, cams, levers and other components. Graph, table, photographs. (T7, H general, ST, Cu, Ni)

284-T. Aluminum vs. Steel. III. *Modern Metals,* v. 10, Aug. 1954, p. 34 + 5 pages.

Competition in container, construction and prefabrication fields. Tables, photographs. (T10, T26, ST, Al)

285-T. Structural Uses for Sheet and Plate in Europe. Cedric Marsh. *Modern Metals,* v. 10, Aug. 1954, p. 68, 70-71.

Progress and problems in adapting techniques used with other materials and industries for aluminum in the building trade. Photographs, diagram. (T26, Al)

286-T. Aluminum in Telephone Cable Sheath. E. W. Reynolds. *Modern Metals,* v. 10, Aug. 1954, p. 76-79.

Design, production and advantages of Stalpeth cable sheath composed of steel, aluminum and polyethylene. Photographs, diagrams. (T1, Al, CN)

287-T. (German.) **Aluminum Pistons in the Cylinders of Internal Combustion Engines.** E. Koch. *Aluminium,* v. 30, nos. 8-9, Aug.-Sept. 1954, p. 333-340.

Maximum efficiency achieved in design stage and by suitable choice of alloy and maintenance of high order of dimensional accuracy during machining. Photographs, diagrams, tables, micrograph. 8 ref. (T7, G17, Al)

288-T. (German.) **Aluminum Tubes for Heat Exchangers.** G. Lenk. *Aluminium,* v. 30, nos. 8-9, Aug.-Sept. 1954, p. 346-354.

Survey of uses, technical and economic advantages, effect of coolant water, methods of protection and cleaning and design data. Photographs, tables, graph, diagram. 2 ref. (T25, Al)

289-T. (German.) **Mining Cages of Light Metals.** O. Hanefeld. *Aluminium,* v. 30, nos. 8-9, Aug.-Sept. 1954, p. 355-359.

Possibilities and limitations of application. Rust protection and riveting. Photographs, diagram. 1 ref. (T28, R general, K13, Al)

290-T. (German.) **Pseudoconductivity Measurements on Germanium-Indium Alloy Rectifiers.** Hans-Ludwig Rath. *Zeitschrift für Naturforschung,* v. 9a, nos. 7-8, July-Aug. 1954, p. 699-700.

Electrical characteristics of germanium-indium rectifiers with temperature. Graphs. 7 ref. (T1, P15, In, Ge)

291-T. An Evaluation of a V-6 Aluminum Engine. John R. Long and Donald H. Perry. *Automotive Industries,* v. 111, Sept. 15, 1954, p. 70-72.

Cast aluminum engine parts for automotive applications approaching an economic and engineering reality. Photographs, graph. (T21, Al)

292-T. Poppet Valves, Guides and Seats. I. A Survey of Valve Materials and General Design Features. *Automobile Engineer,* v. 44, Sept. 1954, p. 349-356.

Causes of and corrective measures for valve failure, processes in valve production, valve forms. Tables, diagrams, photographs, graph. (To be continued.) (T7)

293-T. Jet Engine Metallurgy. R. B. Johnson, Jr. *Electric Furnace Steel Proceedings,* v. 11, 1953, p. 45-54.

Operating temperatures of typical aircraft gas turbine and an outline of problems in regard to materials in certain engine components. Graphs, micrographs, photographs, diagram. (T25, Mg, Al, Cr)

294-T. Application of Metals and Alloys in Petroleum Refining. I. W. L. Nelson. *Oil and Gas Journal,* v. 53, Sept. 27, 1954, p. 117.

Metals that have been employed in equipment for corrosion service. Table. (T28, R7)

295-T. (German.) **Mold Types in Electrotyping.** Walter Hediger. *Fachhefte für die Chemiegraphie, Lithographie und den Tiefdruck,* 1954, no. 3, p. 93-101.

Survey of molding processes, metal matrices, wax, cellon and lead molds and silvered molds formed by the spray method. Diagrams. (T9, Ag)

296-T. Steels for Mines. *Edgar Allen News,* v. 33, Sept. 1954, p. 193-195.

Principal qualities of mining drill steels and uses, heat treatment, tungsten carbide tipped drilling equipment. Tables, photographs. (To be concluded.) (T28, T6, TS)

297-T. Manganese Steel for the Lumber Industry. *Edgar Allen News,* v. 33, Sept. 1954, p. 196-197.

Tough, strong, wear-hard qualities favorable for lumber industry equipment. Photographs, table. (To be continued.) (T29, AY)

298-T. High-Coercive-Force Permanent-Magnet Materials and Their Application. T. O. Paine and L. I. Mendelsohn. *Electrical Engineering,* v. 73, Oct. 1954, p. 891-895.

Includes graphs, table, diagrams. 18 ref. (T general, P16, SG-n)

299-T. Signal Corps-Developed General-Purpose Multicontact Connectors. Milton Tenzer. *Electrical Manufacturing,* v. 54, Oct. 1954, p. 85-89.

Knife-blade type with low insertion force is self-sealing and cleaning. It is made of cadmium-plated cast aluminum and is watertight both in mated and unmated positions. Photographs, diagrams, tables. (T1, Al, Cd)

300-T. Four Factors Determine Selection of Leaded Steels. F. J. Robbins. *Iron Age,* v. 174, Oct. 7, 1954, p. 117-120.

Advantages and possible applications. Photographs. 6 ref. (T general, AY)

301-T. Developments in Nimonic Alloys. *Metal Industry,* v. 85, Sept. 17, 1954, p. 232.

Applications of extruded sections in gas turbines. Photographs, graph, diagram. (T25, Ni)

302-T. Materials for Gas Turbines. H. Sutton. *Metallurgia,* v. 50, no. 299, Sept. 1954, p. 131-134.

Mechanical properties of various materials and how they meet requirements. Tables. (T25, Q general)

303-T. Special Ceramics for Engineering Uses. T. G. Carruthers and A. L. Roberts. *Research,* v. 7, Oct. 1954, p. 379-383.

Possible use of sintered oxides—particularly alumina—as cutting tool materials. Table, photograph. 7 ref. (T6, SG-j)

304-T. The Metallurgy of Hot-Formed Springs. W. O. Beale and C. G. Lowth. *Australasian Engineer,* 1954, Aug., p. 54-58; disc., p. 58-61.

Springs manufactured from hot-rolled bar stock and the merits of the various grades of steel. Metallurgical aspects of steelmaking, rolling, spring manufacture and finished springs in relation to their service requirements. Graphs, diagrams, table. 4 ref. (T7, ST)

305-T. Aluminum Foil in Transformer Coils. Albert Zack. *Modern Metals,* v. 10 Oct. 1954, p. 35-37.

Use of foil eliminates need for fine wire in wafer coils and simplifies winding operation. Photographs, diagrams, graph. (T1, Al)

306-T. Aluminum in the Fishing Industry. *Modern Metals,* v. 10, Oct. 1954, p. 42 + 4 pages.

Applications on boats and all types of fish-handling equipment. Photographs, diagrams. (T22, Al)

307-T. Saving Machining Costs With Aluminum Castings. W. J. Evans. *Modern Metals,* v. 10, Oct. 1954, p. 68-69.

Advantages of aluminum over cast iron. (T general, G17, Al, CI)

308-T. Titanium in Air-Borne and Lightweight Army Equipment. T. E. Perry. *Modern Metals,* v. 10, Oct. 1954, p. 75-76, 78-79.

Fabrication and design solutions developed by Army and contractors. Photographs. (T2, G general, Ti)

309-T. Increasing Civilian Applications for Aluminum. G. Perkins. *Light Metal Age,* v. 12, Oct. 1954, p. 16-17.

Sheet, foil and castings in various applications. Photograph. (T general, Al)

310-T. How Many Pounds of Zinc Die Castings Go Into Today's Cars? *Precision Metal Molding,* v. 12, Nov. 1954, p. 39-41.

Consumption data and typical applications. Graph, photographs. (T21, Zn)

311-T. Materials Development for the Submarine Thermal Reactor. William A. Johnson. *Westinghouse Engineer,* v. 14, Nov. 1954, p. 208-212.

Use of zirconium, corrosion, wear of materials and coolant development. Photographs, diagram. (T25)

312-T. (French.) Cast and Welded Construction Combined in Cockerill-Baldwin Diesel-Electric Locomotives for Otraco. M. Alexandre and P. Laval. *Ossature métallique,* v. 19, no. 10, Oct. 1954, p. 485-490.

Construction of trucks and frame. Photographs, diagrams. (T23, E general, K general, ST)

313-T. (French.) Sets of Extruded Bars in First and Second Class Installations. René Rols. *Revue de l'Aluminium,* v. 31, no 212, July-Aug. 1954, p. 225-230.

Economics and range of application of U-shaped extruded aluminum bus bars; electrical and mechanical design; special techniques of installation. Diagrams, tables, graphs. (To be continued.) (T1, Al)

314-T. (French.) Nickel in the Manufacture of Oxide Cathodes. Jean Challansonnet. *Vide,* v. 9, no. 51, May, 1954, p. 22-27.

Survey of French and European work on use of nickel alloys in electron tubes. Tables, diagrams. (T1, Ni)

315-T. (German.) Handling and Treating Hard Metal Tools for Percussion and Rotary Drills and Drill Rods. Otto Müller. *Glückauf,* v. 90, nos. 37-38, Sept. 11, 1954, p. 1074-1085.

Uses of different type drills, methods of attaching drills to drill rods, rod fractures. Heat treatment of hollow drills, forging of drill rods. Tables, diagrams, photographs. 30 ref. (T7, F22, J general, TS)

316-T. (Book.) **Constructional Steelwork Simply Explained.** Oscar Faber. 3rd Ed. 136 p. 1954. Oxford University Press, Amen House, London E.C.4, England; also 114 Fifth Ave., New York 11, N. Y. $2.00.

Revised values and calculating methods for permissible stresses based on new British Standard Regulations. (T26, Q25, ST)

317-T. (Book.) **Symposium on Aluminium in Building.** 130 p. 1954. Aluminium Development Association, 33 Grosvenor St., London, W.1. 4s.

Includes "An Architect's Appraisal of Aluminium in Building", Robert H. Matthew; "Aluminium and Craftsmen in Building", G. H. Friese-Greene; and "Aluminium for Roofing and Cladding", E. G. West. (T26, Al)

SECTION V

MATERIALS—
General Coverage of Specific Materials

1-V. The Platinum Group Metals. *Metal Treatment and Drop Forging,* v. 20, Oct. 1953, p. 472-478.
Discovery and sources of platinum ores, physical properties, corrosion resistance, effect of heating in air, electrical resistance and thermoelectric and catalytic properties. Tables, graphs. (EG-c)

2-V. High Purity Metals. Daniel J. Maykuth. *Product Engineering,* v. 24, Nov. 1953, p. 186-190.
Mechanical and physical properties of highly refined Zn, Al, Fe, Mo, Cr, Ti and Zr have led to new and often unexpected applications. Tables, charts, photographs. 4 ref. (P general, Q general, T general, Zn, Al, Fe, Mo, Cr, Ti, Zr)

3-V. Recent Advances in Light Alloys. F. A. Fox. *Australasian Engineer,* 1953, Sept. p. 56-65.
Review covering production, alloy development, properties and uses. Photographs, graph, table. (Al, Mg, Be, Ti, EG-a)

4-V. Programs Underway to Increase U. S. Production of Strategic Beryllium. B. H. Clemmons and James S. Browning. *Journal of Metals,* v. 5, Nov. 1953, p. 1433-1434.
Occurrence, production and consumption, uses and processing of beryllium. (Be)

5-V. Malleable Irons. *Materials & Methods,* v. 38, Nov. 1953, p. 137.
Tabulates composition, properties and uses of pearlitic, standard 32510 and standard 35018 malleable irons. (P general, Q general, T general, CI)

6-V. (Polish.) **Resistance Strips of Inmet Alloy.** Z. Misiolek. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 3, 1953, p. 119-122.
Methods for melting, casting, hot and cold working and heat treating. Inmet alloy strips met all requirements for resistance materials and are suitable for precision resistors. Tables, graphs. 3 ref. (SG-q, Cu, Mn, Ni, Fe, Al)

7-V. Silvaloy 355 (Silver Brazing Alloy). *Alloy Digest,* no. Ag-1, Dec. 1953.
Composition, physical constants, joint design, fluxing, brazing and applications. Tables. (T5, Ag)

8-V. Aluminum 62S (Age Hardenable, Structural, Wrought Aluminum Alloy). *Alloy Digest,* no. Al-11, Dec. 1953.
Composition, physical constants, properties, heat treatment, machinability, weldability, workability, corrosion resistance, general characteristics and applications. Tables. (Al)

9-V. Bridgeport 712 (Aluminum-Silicon Bronze). *Alloy Digest,* no. Cu-13, Dec. 1953.
Composition, physical constants, properties, heat treatment, machinability, weldability, corrosion resistance and general characteristics. Tables. (Cu)

10-V. U.S.S. A-R Steel (Abrasion Resisting Steel). *Alloy Digest,* no. SA-13, Dec. 1953.
Composition, machinability, workability, weldability, corrosion resistance, general characteristics and applications. Tables. (AY)

11-V. Unicut (High Speed Steel, M-3 Type 1). *Alloy Digest,* no. TS-14, Dec. 1953.
Composition, properties, heat treatment, workability, joining, machinability, general characteristics and applications. Tables. (TS)

12-V. Cascade (Precipitation Hardening Die Steel). *Alloy Digest,* no. TS-15, Dec. 1953.
Composition, physical constants, properties, heat treatment, machinability, weldability, general characteristics, forms available and applications. Tables. (AY, TS)

13-V. Zamak-3 (Zinc Die Casting Alloy). *Alloy Digest,* no. Zn-1, Dec. 1953.
Composition, physical constants, properties, castability, workability, machinability, weldability, heat treatment, corrosion resistance and general characteristics. Tables. (Zn)

14-V. Hafnium. J. Lomas. *Canadian Mining Journal,* v. 74, Nov. 1953, p. 80-81.
Discussion of discovery and properties. (Hf)

15-V. Free-Cutting Brass. *Copper & Brass Bulletin,* 1953, Nov., no. 166, p. 8-9.
Composition, machinability, workability, advantages and applications. Photographs, table. (Cu)

16-V. Aluminum Sand Casting Alloys. F. M. Howell and H. S. Jerabek. *Metal Progress,* v. 64, Dec. 1953, p. 96B.
Data sheet gives compositions, properties and designations of American commercial alloys. (S22, Al)

17-V. The Metallurgical and Other Industrial Applications of Manganese and Its Ores. R. A. Dodd. *South African Mining and Engineering Journal,* v. 64, pt. 2, Oct. 10, 1953, p. 205, 207.
Occurrence, composition and classification of manganese ores. Utilization of 90% of world production of manganese ore by steel industry is reported.
(T general, A4, B10, Mn)

18-V. Ductile Iron as Die & Mold Castings Offers Hardening, Welding, Machinability Advantages. Morris Asimow. *Western Metals,* v. 11, Nov. 1953, p. 50-53.
Composition, microstructure and desirable characteristics. Photographs, graph. (CI)

19-V. (Book.) **The Metallurgy of the Rarer Metals.** 156 p. 1953. The Institution of Metallurgists, 4 Grosvenor Gardens, London S.W.1, England. 15s. 6d.
A series of eight lectures, covering 17 metals as follows: Uranium, by L. Rotherham; Beryllium, by B. A. Scott; Molybdenum, by L. Northcott; Tungsten, by I. Jenkins; Titanium and Zirconium, by J. W. Rodgers; Tantalum and Niobium, by J. C. Chaston; Chromium and Manganese, by E. A. G. Liddiard; Platinum Group, by E. C. Rhodes. Discusses occurrence, extraction, physical and chemical properties, and applications. (EG-b)

20-V. Magnesium Castings. P. E. Moluf. *Electrical Manufacturing,* v. 52, Dec. 1953, p. 98-99.
Properties, production methods, and typical applications of cast magnesium parts for electrical equipment. Photographs, tables.
(T1, E general, Mg)

21-V. Titanium—A Metal of Engineering Importance? P. L. Teed. *Engineering,* v. 176, Nov. 13, 1953, p. 635-637.
Engineering features of titanium and its alloys; civil aircraft costs; uses of titanium and its alloys in aircraft and aircraft engines. Tables. 7 ref. (Concluded.) (T24, Ti)

22-V. The New Metal Titanium. Maurice Cook. *Institute of Metals, Journal,* v. 82, Nov. 1953, p. 93-106.
General review of history, occurrence, reduction processes, melting, properties, alloys and applications. Graphs, diagrams, tables. (Ti)

23-V. Titanium Metal and the Future. *Light Metals,* v. 16, Nov. 1953, p. 378-379.
General review. Production, forming, costs and problems of scrap utilization. (To be continued.) (Ti)

24-V. The Aluminum Smelting Industry. *Modern Metals,* v. 9, Nov. 1953, p. 54-56, 58, 60, 62-64.
History, growth, technology, alloys, markets and outlook. Graphs, table, photographs. (Al)

25-V. All-Around Alloy. L. T. Troutman. *Instrumentation,* v. 7, no. 1, 1953, p. 40-41.
Production, properties and applications of beryllium copper. Photographs. (Cu)

26-V. Engineering Coppers. John L. Everhart. *Materials & Methods,* v. 38, Dec. 1953, p. 123-138.
Development of modified coppers to take advantage of one or more of its properties of high electrical and thermal conductivity, corrosion resistance and ease of working and joining. Commercial grades, engineering properties, applications, forming and fabricating, joining practice and cleaning and finishing. Photographs, tables, graph. (Cu)

27-V. Carbon Molybdenum Steels—Materials Data Sheet. *Materials & Methods,* v. 38, Dec. 1953, p. 143.
Composition, physical, mechanical and fabricating properties; thermal treatment; corrosion resistance; applications of five alloy steels. (AY)

28-V. Norwegian Production of Stainless Steels. J. Sissener. *Metal Progress,* v. 65, Jan. 1954, p. 81-83, 164, 166.
Facilities, methods and products of two Norwegian plants. Foundry practice, alloy compositions and mechanical properties. Photographs, table. (SS)

29-V. Titanium in 1953. James R. Long. *Metal Progress,* v. 65, Jan. 1954, p. 105-107.

Developments in production of sponge, melting, production of ingots, improvement by alloying, welding, fabrication, applications. (Ti)

30-V. Postwar European Progress in Wrought Aluminum and Its Alloys. Paul Brenner. *Metal Progress,* v. 65, Jan. 1954, p. 112-115, 194, 196, 198, 200.
Activities in scrap recovery, alloy development, machinability, joining and applications. Photographs, table. (Al)

31-V. "The New Metal Titanium". *Sheet Metal Industries,* v. 30, no. 320, Dec. 1953, p. 1029-1032, 1076.
Extracts from the Autumn Lecture given to the Institute of Metals by Maurice Cook. Graphs, photographs, table. (Ti)

32-V. (French.) **How to Choose a Light Foundry Alloy.** Charles Roinet. *Revue de l'Aluminium,* v. 30, no. 203, Oct. 1953, p. 375-378.
Two tables present mechanical and physical characteristics, chemical properties, casting and machining possibilities and aptitude to surface treatment of 18 alloys. (Al)

33-V. How to Understand Aluminum, Its Alloys and Tempers. Samuel Storchheim. *American Machinist,* v. 97, Dec. 21, 1953, p. 113-124.
Presents, with minimum of metallurgical terms, introduction to factors necessary to proper application of aluminum. Tables, graphs, photomicrographs. (Al)

34-V. High Silicon Irons. Walter A. Luce. *Chemical Engineering,* v. 61, Jan. 1954, p. 246, 248, 250, 252, 254, 256, 258, 260.
Corrosion resistance, mechanical and physical properties and applications of Duriron and Durichlor. Photographs, tables, graphs.
(R general, P general, Q general, T general, CI)

35-V. Aluminum Alloy Reference Sheet. Harry W. Fritts. *Chemical Engineering Progress,* v. 49, Dec. 1953, p. 675.
Data sheet giving applications, corrosion resistance and physical and mechanical properties.
(T general, R general, P general, Q general, Al)

36-V. Titanium Metal and the Future. *Light Metals,* v. 16, Dec. 1953, p. 410-412.
Control of impurities, machining, heat treating, markets and applications. (To be continued.) (Ti)

37-V. The Production and Uses of Beryllium. I. A. G. Thomson. *Mining Journal,* v. 241, Dec. 4, 1953, p. 661-662.
Sources and extraction. 4 ref. (To be continued.) (B general, Be)

38-V. A Look Back at Light Metals in 1953. *Modern Metals,* v. 9, Dec. 1953, p. 72, 74-76, 78-85.
Applications, forming, fabrication, powder metallurgy, coatings, brazing, smelting and production trends. Photograph. (EG-a)

39-V. New Metals in Atomic Energy. W. A. Johnson. *Steel Processing,* v. 39, Dec. 1953, p. 659-663, 666-667.
Zirconium, beryllium and uranium are considered. (T25, Zr, Be, U)

40-V. (Book.) **The Manufacture of Iron and Steel.** D. J. O. Brandt. 384 p. English Universities Press, St. Paul's House, Warwick St., London. 15s.
General practices in manufacture of iron and steel; smelting, casting, rolling, welding, and heat treating. (D general, E general, F23, K general, J general, Fe, ST)

41-V. (Book—French.) **(Congress of Heat Resistant Materials.) Congres des Materiaux Resistant a Chaud.** 398 p. 1951. Editions Metaux, 32 Rue du Marechal Joffe, Saint Germain en Laye, Paris. 5000 francs.
Discusses heat resistant materials including refractories, metals, alloys, cermets, and organo-metallic materials. Covers measuring instruments, creep and applications in jet and other high-temperature installations. (Q3, Q4, T general, SG-h)

42-V. Bognalite J. Heat Treatable Aluminum Casting Alloy. *Alloy Digest,* no. Al-12, Jan. 1954.
Composition, physical constants, properties, heat treatment, machinability, and characteristics. (Al)

43-V. Meehanite GA. High Strength, Close Grain Iron Casting. *Alloy Digest,* no. CI-5, Jan. 1954.
Composition, physical constants, properties, machinability and general characteristics. (CI)

44-V. RY-AX. Heat Treated, Carbon-Manganese Steel. *Alloy Digest,* no. CS-1, Jan. 1954.
Composition, physical constants, properties, machinability and general characteristics. (CN, Mn)

45-V. C.D.C. Manganese Alloy No. 720. Heat-Treatable, Corrosion Resistant Alloy. *Alloy Digest,* no. Cu-14, Jan. 1954.
Composition, physical constants, properties, heat treatment, machinability, workability, weldability and general characteristics. (Cu, Mn, Ni)

46-V. Ti-150A. Titanium-Base Alloy. *Alloy Digest,* no. Ti-2, Jan. 1954.
Composition, physical constants, properties, heat treatment, machinability, workability, weldability and general characteristics. (Ti)

47-V. Van Chip. Tungsten-Molybdenum Type High Speed Steel. *Alloy Digest,* no. TS-16, Jan. 1954.

Composition, properties, heat treatment, machinability, workability, protective coatings, general characteristics and applications. (TS)

48-V. Fansteel 77. High-Density Tungsten Alloy. *Alloy Digest,* no. W-1, Jan. 1954.

Composition, physical constants, machinability, corrosion resistance, and applications. (W)

49-V. Some Methods of Preparation, Properties and Applications of Molybdenum. D. J. Jones. *Alloy Metals Review,* v. 8, Dec. 1953, p. 2-8.

Molybdenum is reported as promising material to withstand high temperatures and conditions of stress involved in gas turbines. Tables, graphs. 13 ref. (Mo)

50-V. Zirconium—From Rarity to Reactors. Charles A. Scarlott. *ASTM Bulletin,* 1953, no. 194, p. 45-46.

Properties, economics, processing and applications. Photographs, table. (Zr)

51-V. Vanadium—Properties, Occurrence, Beneficiation & Reduction. G. P. Mather and P. I. A. Narayanan. *Journal of Scientific & Industrial Research,* v. 12, sec. A, Nov. 1953, p. 510,514.

World production and occurrence. 10 ref. (V)

52-V. Developments in the Metallurgy of Tin and Its Alloys. J. W. Cuthbertson. *Metallurgia,* v. 48, no. 290, Dec. 1953, p. 277-281.

Recent progress in tinplate production, ternary and aluminum-tin bearing alloys and electrodeposition of tin-zinc and tin-nickel alloys. Photographs, micrographs, table. 12 ref. (L17, Sn)

53-V. The Present Status of Magnesium and Its Alloys. R. G. Wilkinson. *Metallurgia,* v. 48, no. 290, Dec. 1953, p. 282-288.

Survey of recent developments with particular attention to casting alloys containing zirconium and thorium, which have greatly improved properties at elevated temperatures. Photographs, tables, graphs, micrographs. 13 ref. (Mg)

54-V. Copper and Copper Alloys. A Survey of Technical Progress During 1953. E. Voce. *Metallurgia,* v. 48, no. 290, Dec. 1953, p. 289-298.

Material resources, extraction, fabrication, finishing, properties, applications, corrosion, welding and powder metallurgy. 230 ref. (Cu)

55-V. Tantalum. *Metal Treatment and Drop Forging,* v. 20, Dec. 1953, p. 590.

Difficulties in treatment, fabrication and handling due to absorption of gases. (Ta)

56-V. The Production and Uses of Beryllium. II. A. G. Thomson. *Mining Journal,* v. 241, Dec. 18, 1953, p. 724-725.

Properties, applications, availability and supply. (Be)

57-V. On the Properties of Spheroidal Graphite Cast Iron. M. Ballay, R. Chavy and J. Grilliat. Henry Brutcher, Altadena, Cal., Translation no. 2952, 2 p. + 1 plate. (Abstract from *Fonderie,* v. 68, 1951, p. 2589-2604; v. 69, 1951, p. 2636-2652.

Previously abstracted from original. See item 172-V, 1951. (CI)

58-V. (English.) **The Use of Silicon in Special Steel.** *Aciers Fins & Spéciaux Francais,* 1953, no. 13, Mar., p. 25-32.

Importance, efficiency and properties of silicon when used as an alloy with iron and steel. Graphs. (Si, CI, AY)

59-V. (German.) **The Malleable Zinc Alloy ZnMnIPb.** J. Schramm, *Metall,* v. 7, nos. 21-22, Nov. 1953, p. 862-870.

Composition, melting, casting, extruding, drawing, shaping and forging. Properties, effect of various metal additions, corrosion resistance and prospective uses for the wrought alloy. Tables, graphs, diagrams, micrographs. 8 ref. (Zn)

60-V. (Hungarian.) **Special Brass Alloys.** Sandor Polgary. *Aluminium (Budapest),* v. 5, no. 12, Dec. 1953, p. 258-260.

Research results gained in the last two years in Hungary on handling and application of these materials. Foundry alloys, cold forming alloys and significance of zinc content. (T general, Cu, Zn, Al, Mn)

61-V. Aluminum Alloy Reference Sheet. Harry W. Fritts. *Chemical Engineering Progress,* v. 50, Jan. 1954, p. 54.

Composition, formability, heat treatment, weldability, corrosion resistance, properties. (Al)

62-V. New Heat Resistant Alloy. M. N. Ornitz and R. H. English. *Materials & Methods,* v. 39, Jan. 1954, p. 82-85.

Improved structural stability and resistance to oxidation make this nickel-chromium-iron alloy suitable for service to 2200° F. Photographs, graphs, tables. 2 ref. (R2, Q general, Ni, Cr, Fe)

63-V. Permanent Magnet Steels and Alloys. D. Hadfield. *Metal Treatment and Drop Forging,* v. 21, Jan. 1954, p. 15-24.

Permanent - magnet production process, manufacture and future

trends. Photographs, tables, graphs. 18 ref. (SG-n)

64-V. New Techniques Tame Titanium. Robert Jaffee. *SAE Journal,* v. 62, Jan. 1954, p. 34-37.

Based on secretary's report of Panel on Titanium, Aeronautic Production Forum, SAE National Aeronautic Meeting, New York, April 20, 1953. Production, applications, and properties of titanium. (T24, Ti)

65-V. Germanium, a Secondary Metal of Primary Importance. Robert C. Fite. *Scientific Monthly,* v. 78, Jan. 1954, p. 15-18.

Historical recap with properties, occurrence, and uses. Photographs, diagrams. 4 ref. (Ge)

66-V. Titanium the Metal of 1954? Elmer H. Hahn, Jr. *Tooling and Production,* v. 19, Jan. 1954, p. 39-43.

Properties, availability, and applications. Photographs. (Ti)

67-V. (French and German.) **PMG-Bronzes.** H. Bovet. *Pro-Metal,* v. 6, no. 36, Dec. 1953, p. 254-260.

Origin, properties, and uses. Micrographs, tables, graph, photographs. (Cu, Zn)

68-V. (Polish.) **Method and Production of Cobalt-Tungsten Alloy.** St. Stolarz. *Prace Instytutow Ministerstwa Hutnictwa,* v. 5, no. 5, Sept.-Oct. 1953, p. 298-302.

Chemical composition, density, hardness, and strength properties. Microscopic observations. Photographs, tables, diagrams, micrographs. 3 ref. (Co, W)

69-V. Ceralumin "C". Nickel-Aluminum High Strength, Low Weight Casting Alloy. *Alloy Digest,* no. Al-13, Feb. 1954.

Composition, physical constants, properties, machinability, weldability and general characteristics. (Al)

70-V. Belmalloy. Pearlitic Malleable. Iron. *Alloy Digest,* no. CI-6, Feb. 1954.

Composition, physical constants, properties, machinability and general characteristics. (CI)

71-V. Allegheny 4750. High Magnetic Permeability, Low Expansion Iron-Nickel Alloy. *Alloy Digest,* no. Fe-4, Feb. 1954.

Composition, physical constants, properties, machinability, heat treatment, workability and general characteristics. (Fe, Ni, SG-p, s)

72-V. Dowmetal 01. Heat Treatable Magnesium Wrought Alloy. *Alloy Digest,* no. Mg-8, Feb. 1954.

Composition, physical constants, properties, machinability, workability, weldability, corrosion resistance, and general characteristics. (Mg)

73-V. Refractaloy 26. Precipitation-Hardened Super Heat Resistant Alloy. *Alloy Digest,* no. Ni-8, Feb. 1954.

Composition, physical constants, properties, heat treatment, machinability, weldability and general characteristics. (SG-h, Ni, Co)

74-V. AISI-4340. Nickel-Chromium-Molybdenum Alloy Steel. *Alloy Digest,* no. SA-14, Feb. 1954.

Composition, physical constants, properties, machinability, heat treatment, weldability and general characteristics. (AY)

75-V. Halvan. Shock Resistant Tool Steel. *Alloy Digest,* no. TS-17, Feb. 1954.

Composition, properties, heat treatment, machinability and general characteristics. (TS)

76-V. High Purity Chromium: Key to Better Alloys. H. L. Gilbert and H. A. Johansen. *Iron Age,* v. 173, Jan. 21, 1954, p. 93-96.

Production and physical and mechanical properties. Possibilities of new alloys with higher strengths at high temperatures. Photographs, photomicrographs, table. 15 ref. (Cr)

77-V. Beryllium: Metal with a Future. *Chemical Age,* v. 70, Jan. 23, 1954, p. 279-282.

Production and uses. 3 ref. (Be)

78-V. Selenium. Its Uses and Recovery. *Glass,* v. 31, Jan. 1954, p. 21-22, 24.

Shortage of product and possible sources of recovery. (Se)

79-V. Non-Heat-Treatable Titanium Alloys. Processing Details. T. A. Dickinson. *Light Metals,* v. 17, Jan. 1954, p. 16-17.

Processing, welding, cleaning and application. Physical, mechanical properties and corrosion resistance. Photographs, table. (Ti)

80-V. Titanium Metal and the Future. *Light Metals,* v. 17, Jan. 1954, p. 14-16. (From "Titanium Metal and Its Future", Harvard Graduate School of Business Administration. Copies available from Clifton D. Crosby, 439 Bronxville Road, Bronxville, N. Y. $10.)

Compares mechanical properties, corrosion resistance and cost of titanium with stainless steel, aluminum, magnesium, zirconium, copper and copper alloys and other metals and materials. Table. (To be continued.) (R general, Q general, Ti, SS, Al, Mg, Cu, Zr)

81-V. (Pamphlet.) **Titanium Bibliography.** PB111196. Battelle Memorial Institute for Watertown Arsenal. 204 p. 1952. Available from OTS, U. S.

Dept. of Commerce, Washington 25, D. C. Mimeo. $3.00.

A bibliography of titanium literature covering practically the entire industry between 1900 and 1951, with supplement for 1952. Listed are articles, arranged by authors and subjects, on sources of supply of raw material; its chemistry; and its physical and mechanical properties while being machined; joined, welded or otherwise shaped. (Ti)

82-V. (Pamphlet.) **Titanium Bibliography, 1900-1951; 1952 Supplement.** PB111196S. 52 p. 1953. Battelle Memorial Institute for Watertown Arsenal. Available from OTS, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo. $1.00.

Supplement covers literature of titanium appearing in 1952. Reflects rapid metallurgical growth of this important metal. (Ti)

83-V. (Book.) **Heat-Resisting Steels and Alloys.** C. G. Conway. 160 p. George Newnes Ltd., Tower House, Southampton Street, Strand, London W.C.2, England. 25s.

Carbon and low-alloy steels; bolt and valve steels; heat resistant casting alloys; austenitic steels of standard type; and iron-base and nickel-base alloys of proprietary type. (SG-h, ST, AY, SS, Ni)

84-V. (Book.) **Portfolio of Materials File Facts for Engineers, Designers, Metallurgists and Production Men.** Ed. 4. 112 p. Reinhold Publishing Corp., 330 W. 42nd St., New York 36.

Irons, steels, stainless steels, nonferrous metals, nonmetallic materials, and heat treating methods. (J general, Fe, ST, SS, EG-a)

85-V. (Book.) **The Rare Earths.** John Eisel, et al. 87 p. Feb. 1952. Harvard Graduate School of Business Administration, Cambridge, Mass. $5.00.

History, availability, uses, and future of the rare earths. (EG-g)

86-V. (Book.) **Sheet and Plate Product Information.** 149 p. 1953. Kaiser Aluminum and Chemical Sales, Inc., Kaiser Bldg., 1924 Broadway, Oakland 12, Calif.

Properties of aluminum; applications of sheet and plate alloys; fabrication and finishing methods. Comprehensive tables covering availabilities, properties, and other information of value to aluminum users. Separate pages are allotted to each standard alloy for ease of reference on mechanical properties and specific qualities. (Al)

87-V. (Book.) **Tungsten—Its Metallurgy, Properties, and Applications.** Ed. 3. Colin J. Smithells. 1953. Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N. Y. $8.50.

American edition of book published by Chapman & Hall. See item 137-V, 1952. (W)

88-V. Electrical Steel—Triumph of Steelmaking, Heat Treatment and Scientific Metallurgy. William Jones. *Metal Progress,* v. 65, Feb. 1954, p. 70-74.

Portion of address at ASTM meeting, Oct. 15, 1953, St. Louis. Iron-silicon alloys and their use in magnetic core construction. Photographs, table. (T1, P15, AY)

89-V. Introducing: the New Self-Lubricating High Speed Steels. Stewart G. Fletcher. *Metal Progress,* v. 65, Feb. 1954, p. 161-162, 164, 166.

Improved machinability and internal cutting-edge lubrication are obtained with this new steel. Micrographs, table, photograph. (TS)

90-V. Low-Cost Alloys Offer Good Heat Resistance. R. W. Boring. *Iron Age,* v. 173, Feb. 18, 1954, p. 137-141.

Knowledge of physical, mechanical, chemical and metallurgical properties of wrought heat resistant alloys can aid considerably in proper selection and pay off well in savings of time and money. Photographs, tables. (SS)

91-V. The Manufacture and Use of Boron Steels in the U.S.A. Louis J. Rohl. *Iron and Steel Institute, Journal,* v. 176, Feb. 1954, p. 173-180; disc., p. 180-187.

Presented at special meeting on "Boron in Steel", Iron and Steel Inst., Apr. 1953, London. Survey of development of boron steels as a means of conserving critical alloys. Methods of manufacture using simple and complex boron ferroalloys. Tables, graphs, diagrams, micrographs. 10 ref. (D general, T general, AY)

92-V. Titanium Alloys Give Promise of High Temperature Applications. F. A. Crossley and H. D. Kessler. *Journal of Metals,* v. 6, Feb. 1954, p. 119-121.

Condensed from a paper presented at the AIME Institute of Metals Div. meeting, Cleveland, Oct. 21 to 23, 1953. Comparison of experimental alloys with some commercial types. Tables, graphs. 5 ref. (T general, Ti)

93-V. High-Strength Low-Alloy Steels. *Materials & Methods,* v. 39, Feb. 1954, p. 117-132.

General characteristics, corrosion resistance, special service properties, joining and working characteristics, design considerations, applications and economics of use. Photographs, tables, graphs. 22 ref. (AY)

94-V. Metallurgical Aspects of High Temperature Steam and Gas Turbine Plants. J. M. Robertson. *North East Coast Institution of Engineers & Shipbuilders, Transactions,* v. 70, Feb. 1954, p. 217-252.

Composition, mechanical properties, corrosion, heat treatment and welding of steels and other alloys for use above 850° F. Graphs, tables. (SG-h, SS, Ni, Co, Cr)

95-V. How to Classify Copper Base Alloys. III. *Steel,* v. 134, Feb. 15, 1954, p. 114-115, 118.

Most copper-base compositions for castings are mixed brass and bronze. Usually in the alpha range, alloys often contain lead and other minor ingredients. Photographs, table. (Cu)

96-V. Way to Save Nickel. *Steel,* v. 134, Feb. 15, 1954, p. 122.

New alloying technique. Photographs. (Ni)

97-V. Aluminum 195. (Heat Treatable Sand Casting Alloy). *Alloy Digest,* no. AL-14, Mar. 1954.

Composition, physical constants, ability, weldability, general characproperties, heat treatment, machinteristics and applications. (Al)

98-V. Stressproof. (A High Strength, Free-Machining Bar Steel). *Alloy Digest,* no. CS-2, Mar. 1954.

Composition, physical constants, properties, machinability, characteristics and applications. (CN)

99-V. Inconel (Corrosion-Resistant Nickel Alloy). *Alloy Digest,* no. NI-9, Mar. 1954.

Composition, physical constants, properties, heat treatment, workability, machinability, corrosion resistance, weldability, general characteristics and applications. (Ni)

100-V. AISI 8640. (Oil Hardening Triple Alloy Steel). *Alloy Digest,* no. SA-15, Mar. 1954.

Composition, properties, heat treatment, machinability, weldability and general characteristics. (AY)

101-V. Misco Metal. (Heat and Corrosion Resistant Steel). *Alloy Digest,* no. SS-13, Mar. 1954.

Composition, physical constants, properties, machinability, weldability and applications. (SS)

102-V. Sparta. (Air Hardening Die Steel). *Alloy Digest,* no. TS-18, Mar. 1954.

Composition, properties, heat treatment, workability, machinability, applications, characteristics. (TS)

103-V. Pressurdie-3. (Pressure Die Steel). *Alloy Digest,* no. TS-19, Mar. 1954.

Composition, properties, heat treatment, machinability, uses. (TS)

104-V. Titanium: Progress, Problems, Prospects. Harries-Clichy Peterson. *Analysts Journal,* v. 10, Feb. 1954, p. 61-65.

Developments and uses. (Ti)

105-V. Silver. Roberto Antoniolli. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 502, Feb. 1954, p. 94-105.

Production, consumption, availability and applications. Tables, graphs. 55 ref. (Ag)

106-V. Toward a System of Zirconium Chemistry. Warren B. Blumenthal. *Industrial and Engineering Chemistry,* v. 46, Mar. 1954, p. 528-539.

General discussion of zirconium, its compounds and their properties with emphasis on electrochemistry. Photograph. 67 ref. (P15, Zr)

107-V. Titanium Progress in 1953. T. W. Lippert. *Light Metal Age,* v. 12, Feb. 1954, p. 16-17.

Production, needs and advancements made in past year. Photographs. (Ti)

108-V. (Book.) **Engineering Steels.** Leslie Aitchison and William I. Pumphrey. 923 p. 1953. MacDonald & Evans, Ltd., Bedford Row, W.C.1, London, England. Available from British Book Centre, 420 W. 45th St., New York 36, N. Y. $15.75.

A study of the properties of steels and the principles governing their selection for engineering applications. Manufacture, fabrication, heat treatment, metallurgy. (ST)

109-V. (Book—German.) **(Comprehensive Treatise on Ferrous Metallurgy.) Gemeinfassliche Darstellung des Eisenhüttenwesens. Ed. 16.** Society of German Metallurgists. 581 p. 1953. Verlag Stahleisen M.B.H., Düsseldorf, Germany. DM38.50.

Guide for laymen, commercial engineers, students and expert metallurgists. Synopsis of entire field. Graphs, illustrations, tables. (Fe)

110-V. The Quality of Toolsteel—Recent Developments and Future Predictions. Burns George. *Metal Progress,* v. 65, Mar. 1954, p. 75-78.

Improvements made possible with use of electric furnaces and quality inspections. Photograph. (D5, S general, TS)

111-V. German Investigations on Boron Steels. Robert Scherer and Karl Bungardt. *Metal Progress,* v. 65, Mar. 1954, p. 101-106, 174, 176, 178.

Use of boron saves nickel and chromium. Hardenability studies and tensile and impact properties. Graphs, tables. (J26, Q23, AY)

112-V. Vanadium-Bearing High Tensile Weldable Steels. *South African Mining and Engineering Journal,*

v. 64, pt. 2, Feb. 6, 1954, p. 821, 823, 825.

Research work on possible replacement of molybdenum by vanadium for high-tensile weldable steels. Preparation of experimental steels, their heat treatment, and their mechanical properties. Tables. (J general, Q general, AY)

113-V. (Dutch.) **Titanium. II. Possible Workability and Special Properties.** E. C. Smits. *Bedrijf en Techniek,* v. 9, no. 196, Feb. 27, 1954, p. 105, 107, 109.

Behavior in casting, high-temperature forging, cutting, bending, deep drawing, plating and heat treating. Tendency of titanium to absorb oxygen and nitrogen at high temperatures. (Ti)

114-V. (Dutch.) **Copper and Copper Alloys. XIII. Brass.** W. G. R. De Jager. *Metalen,* v. 9, no. 3, Feb. 15, 1954, p. 42-43.

Hardness, tensile strength and annealing of three types of brass. Graph, table. (To be continued.) (Q29, Q23, J23, Cu)

115-V. **Zirconium.** L. Sanderson. *Canadian Mining Journal,* v. 75, Mar. 1954, p. 67-69.

History, physical, chemical and mechanical properties, use in nuclear energy production, reduction processes, sources, industrial applications and alloys. (Zr)

116-V. **Rhenium Metal. Its Properties and Future.** L. W. Kates. *Materials & Methods,* v. 39, Mar. 1954, p. 88-91.

Rhenium in ductile form investigated for electrical contacts, thermocouple alloys and pen points. Photographs, tables. 2 ref. (Re)

117-V. **Chromium-Manganese Stainless Steels.** John L. Everhart. *Materials & Methods,* v. 39, Mar. 1954, p. 92-94.

Continuing shortage of nickel is reviving interest in substitutes having properties that compare favorably with those of chromium-nickel steels. Tables, photographs. 9 ref. (SS, Cr, Mn)

118-V. **Materials Data Sheet. Nitriding Steels.** *Materials & Methods,* v. 39, Mar. 1954, p. 139.

Composition, physical, mechanical and fabricating properties, thermal treatment and corrosion resistance. (J28, AY)

119-V. **Rhenium.** *Metal Industry,* v. 84, Mar. 5, 1954, p. 190.

History, sources, recovery processes, fabrication methods and applications. Table. (Re)

120-V. **Research Progress: Titanium Alloys. I.** *Metal Industry,* v. 84, Mar. 5, 1954, p. 194.

Characteristics of principal alloys. (Ti)

121-V. **Titanium. The Metal of 1954? II.** Elmer H. Hahn, Jr. *Tooling and Production,* v. 19, Mar. 1954, p. 58-62, 65, 113.

Welding, grinding, machining, casting, forging and scrap recovery. Photograph. 40 ref. (Ti)

122-V. **Effect of Impurities in Tin on the Properties and Uses of the Metal and Alloys Containing Tin.** Charles L. Mantell. Paper from "Symposium on Tin". ASTM Special Technical Publication no. 141. p. 57-83.

Comprehensive survey of literature. Effects on various grades of tin, solders, babbitt metals and bearing metals. Tables. 82 ref. (Sn)

123-V. (English.) **Aluminium and Its Alloys in 1953. Some Aspects of Research and Technical Progress Reported.** E. Elliott. *Metallurgia,* v. 49, no. 292, Feb. 1954, p. 82-90.

Extraction, founding, fabrication, constitution and properties. 107 ref. (Al)

124-V. (French.) **Recent Progress in Tin Research.** E. S. Hedges. *Metallurgia italiana,* v. 46, no. 1, Jan. 1954, p. 13-21.

Work of Tin Research Institute in field of tin plating, electrodeposition of tin and its alloys, corrosion, antifriction alloys, pewter ware, copper-base alloys and tin-base organo-metallic compounds. Photographs, micrographs. (Sn)

125-V. **Tenzaloy (High Strength Aluminum Casting Alloy).** *Alloy Digest,* no. Al-15, Apr. 1954.

Composition, physical constants, properties, heat treatment, machinability, weldability, castability, corrosion resistance and general characteristics. (Al)

126-V. **Tuf Stuf 224K (Heat Treatable Aluminum Bronze).** *Alloy Digest,* no. Cu-15, Apr. 1954.

Composition, physical constants, properties, heat treatment, machinability, weldability and general characteristics. (Cu)

127-V. **AISI E52100 (Bearing Steel).** *Alloy Digest,* no. SA-16, Apr. 1954.

Composition, physical constants, properties, heat treatment, machinability and general characteristics. (AY)

128-V. **U.S.S. Cor-Ten (High-Strength Low-Alloy Steel).** *Alloy Digest,* no. SA-17, Apr. 1954.

Composition, properties, heat treatment, machinability, workability, weldability, corrosion resistance, general characteristics and applications. (AY)

129-V. Carpenter Stainless No. 10 (A Stainless Steel for Severe Service). *Alloy Digest,* no. SS-14, Apr. 1954.

Composition, physical constants, properties, workability, machinability, corrosion resistance, pickling and general characteristics. (SS)

130-V. Rem-Cru C-130AM (Titanium Alloy). *Alloy Digest,* no. Ti-3, Apr. 1954.

Composition, physical constants, properties, heat treatment, workability, machinability, weldability and general characterisics. (Ti)

131-V. Bearcat (Shock-Resisting Tool Steel). *Alloy Digest,* no. TS-20, Apr. 1954.

Composition, properties, heat treatment, workability, machinability and general characteristics. (TS)

132-V. Non-Heat Treatable Titanium Goes To Work. Thomas A. Dickinson. *Steel,* v. 134, Apr. 5, 1954; p. 136-137, 140.

Methods for annealing, welding, inspection, forming and machining. Photographs, table. (Ti)

133-V. (Russian.) **Magnesium Alloys.** Ia. E. Afanas'ev. *Vestnik Mashinostroeniia,* v. 34, no. 2, Feb. 1954, p. 39-42.

Chemical compositions and physical, mechanical and technological properties. Tables. 5 ref. (Mg)

134-V. (Book.) **Heat-Resisting Steels and Alloys.** C. G. Conway. 160 p. 1953. D. Van Nostrand Co., Inc., 250 4th Ave., New York 3, N. Y. $5.00.

A concise data book giving high-temperature properties of commercial steels and alloys. (SS, SG-h)

135-V. (Book.) **Metallurgy of the Rarer Metals. Chromium.** A. H. Sully. **Zirconium.** G. L. Miller. v. I-II. 225 and 400 p. Academic Press Inc., 125 E. 23rd St., New York. $5.50 and $7.50.

History and occurrence of the metals; world supplies; consumption and use; commercial alloys; physical properties; casting; fabrication; and use of metal. (Cr, Zr)

136-V. (Book.) **Symposium on Tin.** ASTM Special Technical Publication no. 141. 111 p. 1952. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $2.50. $1.85 to members of ASTM.

Production; resources; coatings; properties; applications; and analysis. Papers are separately abstracted. (Sn)

137-V. Tantalum and Columbium. Joseph W. Rose. *American Machinist,* v. 98, Apr. 12, 1954, p. 189-198.

With certain limitations these refractory metals can be formed, machined and welded on conventional equipment. Photographs, table, diagrams. (Ta, Cb)

138-V. Zirconium. *American Machinist,* v. 98, Apr. 12, 1954, p. 199-202.

Current shop practice and some working problems encountered. Tables. (Zr)

139-V. Republic Team Digs up Titanium Data. Irving Stone. *Aviation Week,* v. 60, Apr. 12, 1954, p. 30 + 6 pages.

Data on forming and working in general. Properties of structures after fabrication. Photographs. (F general, G general, Ti)

140-V. New Weldable Titanium Alloy. G. E. Hutchinson, D. W. Kaufmann and R. C. Durstein. *Materials & Methods,* v. 39, Apr. 1954, p. 91-93.

Composition, properties, forming, fabricating and availability. Graphs, tables, photographs. (Ti)

141-V. Sources, Supplies and Uses of Beryllium. Robert F. Griffith. *Metal Progress,* v. 65, Apr. 1954, p. 81-85.

Condensed from paper presented at Beryllium Symposium ASM Meeting, Boston, Mar. 1954. Difficulties in recovery of beryllium, development of beryllium copper and commercial markets. Photograph, table. (Be)

142-V. Alpha-Molybdenum Hot-Work Die Steels. R. B. Corbett, J. A. Succop and A. Feduska. *American Society for Metals, Transactions,* v. 46, 1954, p. 1599-1618; disc., p. 1618.

Properties of several steels investigated for possible application as hot work die blocks involved determinations of isothermal transformation characteristics and microstructures. Table, graphs, micrographs, diagram. 10 ref. (T5, TS)

143-V. Aluminum Alloy Reference Sheet. Harry W. Fritts. *Chemical Engineering Progress,* v. 50, Mar. 1954, p. 164.

Composition, mechanical and physical properties, formability, heat treatment, weldability and corrosion resistance. (Al)

144-V. Some Properties and Applications of Indium. *Machinery (London),* v. 84, Apr. 9, 1954, p. 751-752.

Physical properties, principal applications and future possibilities. (In)

145-V. Titanium Requirements of the Airframe Industry. Harold Mosier. *Modern Metals,* v. 10, Apr. 1954, p. 40-42.

Survey of present and future needs in terms of alloys, properties, fabricated forms, dimensions and quantities. Chart. (T24, Ti)

146-V. Titanium-Silicon Alloys. D. A. Sutcliffe. *Metal Treatment and Drop Forging,* v. 21, Apr. 1954, p. 191-197.

Binary titanium alloys containing up to 5.5% silicon by weight were prepared by arc melting. Influence of silicon on various physical properties and solid solubility limits. Tables, photograph, diagram, graphs, micrographs. 10 ref. (C21, P general, Ti)

147-V. (German.) **Production of Germanium.** W. Schreiter. *Chemische Technik,* v. 6, no. 3, Mar. 1954, p. 141-148.

Discovery, natural resources, properties, extraction from ores, flydust and coal and uses in electronic equipment. Tables, photographs. 29 ref. (T1, Ge)

148-V. (Hungarian.) **Drop-Forged Steels. I. The Role of Alloying Metals in Drop-Forged Steels.** Erno Weigl. *Kohaszati Lapok,* v. 9, no. 3, Mar. 10, 1954, p. 122-129.

Role of nickel, manganese, chromium, tungsten and molybdenum. Types of steel, composition, heat treatment and applications. Graphs, table. (F22, Ni, Mn, Cr, W, Mo)

149-V. (Book.) **Comprehensive Inorganic Chemistry.** M. Cannon Sneed, J. Lewis Maynard and Robert C. Brasted. v. II. Copper, Silver, and Gold. J. W. Laist. 248 p. 1954. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N. Y. $5.00.

Covers minerals and ores, concentration, recovery, commercial metals and alloys, chemical properties, and most common compounds of copper, silver, and gold. (Cu, Ag, Au)

150-V. (Book.) **Copper.** Allison Butts, editor. 832 p. Reinhold Publishing Corp., 330 W. 42nd St., New York 36. $20.00.

Recovery, making and use of copper, fundamental principles and industry practice. Includes chemistry and metallurgy of alloys and compounds. (Cu)

151-V. (Book.) **Titanium and Its Compounds.** Gordon Skinner, H. L. Johnston and Charles Beckett. 174 p. 1954. Herrick L. Johnston Enterprises, 540 W. Poplar St., Columbus, Ohio. $5.00.

Review of literature on thermal, structural, electrical, magnetic and other physical properties. (Ti)

152-V. (Book.) German. **(Hard Materials and Hard Metals) Hartstoffe und Hartmetalle.** R. Kieffer and P. Schwarzkopf. 717 p. 1953. Springer-Verlag, Vienna 1, Austria. $19.00.

Preparation and properties of all refractory compounds which can be used in hard metal. Theoretical treatment of atomic structure and survey of literature on preparation and properties of refractory carbides, nitrides, borides, and silicides. Production, properties and application of commercially important cemented carbides. (American edition abstracted as Item 34-V, 1953.) (EG-d, SG-h)

153-V. Reynolds R-301 (Hard-Clad Wrought Aluminum Alloy). *Alloy Digest,* no. Al-16, May 1954.

Composition, physical constants, properties, heat treatment, corrosion resistance and general characteristics. (Al)

154-V. Chase Tellurium Copper (Free-Cutting, High Conductivity Copper Alloy). *Alloy Digest,* no. Cu-16, May 1954.

Composition, phsyical constants, properties, machinability, workability, weldability, corrosion resistance and general characteristics. (Cu)

155-V. Duriron (Corrosion and Wear Resistant Iron Alloy). *Alloy Digest,* no. Fe-5, May 1954.

Composition, physical constants, properties, machinability, weldability, corrosion resistance and general characteristics. (CI)

156-V. Dowmetal H (Heat Treatable Magnesium Casting Alloy). *Alloy Digest,* no. Mg-9, May 1954.

Composition, physical constants, properties, heat treatment, machinability, weldability, corrosion resistance, finishing and general characteristics. (Mg)

157-V. Nimonic 80 Nimonic 80A (Heat and Corrosion-Resisting Nickel-Base Alloys). *Alloy Digest,* Ni-10, May 1954.

Composition, physical constants, properties, machinability, workability, weldability and general characteristics. (Ni)

158-V. AISI 4140 (Oil-Hardening Cr-Mo Steel). *Alloy Digest,* no. SA-18, May 1954.

Composition, properties, heat treatment, machinability, weldability and general characteristics. (AY)

159-V. Zamak-5 (Zinc Die Casting Alloy). *Alloy Digest,* no. Zn-2, May 1954.

Composition, physical constants, properties, castability, workability, machinability, weldability, heat treatment, corrosion resistance and general characteristics. (Zn)

160-V. Some Early Goldwork. Charles Singer. *Endeavour,* v. 13, Apr. 1954, p. 86-93.
Early surviving pieces indicate high degree of craftsmanship and wide empirical knowledge of physical properties of metal. Drawings, maps, photographs. (T9, A2, Au)

161-V. Materials Data Sheet. Uranium and Thorium. *Materials & Methods,* v. 39, May 1954, p. 229.
Physical, mechanical, and fabricating properties. Also corrosion resistance, forms and uses. (U, Th)

162-V. The Metallurgy of Titanium and Zirconium. W. J. Kroll. *Metal Industry,* v. 84, Apr. 23, 1954, p. 325-327.
Critical review of existing patents. Behavior of both metals at high temperature, under various conditions of exposure. Diagrams. 19 ref. (To be concluded.) (Ti, Zr)

163-V. The Aluminium Industry in Great Britain. E. G. West. *Metal Industry,* v. 84, Apr. 30, 1954, p. 345-348.
Present capacities and general trends. Photographs. (Al)

164-V. The British Copper Industry. E. Voce. *Metal Industry,* v. 84, Apr. 30, 1954, p. 357-359.
Present production facilities and mineral sources. Photographs. (Cu)

165-V. Aluminum Alloys for Permanent Mold and Die Casting. *Metal Progress,* v. 65, May 1954, p. 112-B.
Table of composition and mechanical and physical properties of various types.
(E13, Q general, Al)

166-V. Péchiney Beryllium Copper. *Microtecnic (English Ed.),* v. 8, no. 1, 1954, p. 43-50.
Physical, mechanical and chemical properties, machining and applications. Diagram, tables, graph. (Cu)

167-V. The Case for Blue Ribbon Steels. *Steel,* v. 134, May 10, 1954, p. 114-117.
Alloy versus carbon steels. Alloys are expensive but necessary in some cases. Diagrams, graphs, photograph. (AY, CN)

168-V. Industry Leans Heavily on Light Metals. *Steel,* v. 134, May 10, 1954, p. 118-120.
Includes "Cheaper Magnesium Mill Products", W. H. Gross and P. L. Filter; "Higher Strength Aluminum Alloys", Bruce E. Brennan; "Aluminum Design Tips", J. R. Willard; "Promising Al-Mg Alloys", J. R. Young; and "Magnesium Tops for Deep Draws", J. S. Kirkpatrick. Photographs. (Al, Mg)

169-V. Copper-Base Alloys. Toughness and Hardness Have Been Added. *Steel,* v. 134, May 10, 1954, p. 125, 128.
Engineering alloys of precise composition. Predictable properties widen opportunities for application. Photographs. (Cu)

170-V. Now You Can Use Titanium. C. I. Bradford. *Steel,* v. 134, May 10, 1954, p. 148-150.
As mass production lowers cost, nondefense users will use more. Characteristics presented. Table, photographs. (To be continued.) (Ti)

171-V. Titanium. George T. Fraser. Paper from "Materials for Product Development 1953". Clapp & Poliak, p. 85-93.
Fabrication, forming, applications and economics. Photographs, graph, tables. (Ti)

172-V. (French.) **Bessemer Oxygen Steels. Their Industrial Production and Fields of Applicataion.** Jean Wurth. *Ossature métallique,* v. 17, no. 4, Apr. 1954, p. 205-224.
Properties and advantages. Graphs, photographs, tables. 9 ref. (D3, T general, ST)

173-V. Aluminum 14S. Heat Treatable Aluminum Forging Alloy. *Alloy Digest,* no. Al-17, June 1954.
Composition, physical constants, properties, heat treatment, machinability, weldability, corrosion of and general characteristics. Tables. (Al)

174-V. Mueller 600 Bronze. Strong Bearing Bronze. *Alloy Digest,* no. Cu-17, June 1954.
Physical constants, properties, machinability and general characteristics. Tables. (Cu)

175-V. A. S. T. M.-WC1. Alloy Cast Steel. *Alloy Digest,* no. SA-19, June 1954.
Composition, physical constants, properties, machinability and general characteristics. Tables. (AY)

176-V. Mayari-R. Low-Alloy, High-Strength Steel. *Alloy Digest,* no. SA-20, 1954.
Composition, properties, workability and general characteristics. Tables. (AY)

177-V. MISCO-C. Corrosion & Heat Resistant Alloy. *Alloy Digest,* no. SS-15, June 1954.
Composition, physical constants, properties, machinability, corrosion and general characteristics. Tables. (SS)

178-V. MST 3AL-5CR. Titanium-Base Forging Alloy. *Alloy Digest,* no. Ti-4, June 1954.
Composition, physical constants, properties, machinability, weldability and general characteristics. Tables. (Ti)

179-V. Champaloy. Oil-Hardening Tool Steel. *Alloy Digest,* no. TS-21, June 1954.
Composition, properties, heat treatment, machinability and general characteristics. Graph, tables. (TS)

180-V. High Alloy Casting. *Canadian Metals,* v. 17, May 1954, p. 26-27.
Alloys with properties particularly suited to rigorous conditions of high temperature and pressure. Photographs. (E general, SS, CI)

181-V. New Boron Steel Gives Superior Properties. *Canadian Metals,* v. 17, May 1954, p. 52, 54.
High ductility, fatigue resistance, tensile strength and superior machinability. Tables. (AY)

182-V. Tin Brasses. VI. *Copper & Brass Bulletin,* 1954, May, no. 168, p. 8-9.
Properties and maritime uses. Table. (To be continued.) (T22, Cu)

183-V. Nodular Cast Iron. S. B. Bailey. *Iron & Steel,* v. 27, May 1954, p. 193-196.
Present position and future prospects of economic and engineering developments. Graphs, table. (CI)

184-V. Pearlite-Free Basic Bessemer Steel: Its Fabrication and Properties. Åke Josefsson. *Iron and Steel Institute, Journal,* v. 177, May 1954, p. 118-128 + 1 plate.
Easily and economically produced. Impact tests on plates and bend tests on welded specimens. Tables, graphs, diagram, micrographs, photographs. 11 ref. (CN)

185-V. Titanium. Harry S. Brenner. *Machine Design,* v. 26, May 1954, p. 136-140.
Steady development shows widespread commercial application may not be far distant. Photographs. (T general, Ti)

186-V. Zirconium. John D. Roach. *Machine Design,* v. 26, May 1954, p. 156-158.
Properties and uses of this high-strength, low-density, noncorrosive metal. Photographs, tables. (Zr)

187-V. Beryllium. Gordon F. Simson and Simon J. Morana. *Machine Design,* v. 26, May 1954, p. 176-180.
Besides its influence in beryllium copper, other properties and applications are provided. Tables, graph, micrographs. 5 ref. (Be)

188-V. Graphite in Industry. J. Lomas. *Machinery Lloyd (Overseas Ed.),* v. 26, Apr. 24, 1954, p. 75-77.
Advantageous uses of colloidal, electrically produced graphite include lubrication, parting powder in foundry molds, impregnation of metallic and other surfaces and electronics. (E19, G21, H16, Ti, C)

189-V. Titanium, Companion-Metal to Magnesium. *Magnesium,* 1954, May, p. 12-16.
Various uses and properties. Development of deep drawing. Photographs, table, graph. (G4, Ti)

190-V. The Metallurgy of Titanium and Zirconium. W. J. Kroll. *Metal Industry,* v. 84, Apr. 23, 1954, p. 325-327; May 7, 1954, p. 401-403.
Critical review of existing patents. Behavior of both metals at high temperature under various conditions of exposure. Diagrams, tables. 41 ref. (Ti, Zr)

191-V. Tin Compounds and Alloys. Ernest S. Hedges. *Times Review of Industry,* v. 8, new ser., May 1954, p. 24-25.
Outlets recently developed in plastics, pestology and metallurgy. Photographs. (Sn, Cu)

192-V. Literature Survey of High-Strength Steels. *Welding Journal,* v. 33, May 1954, p. 251-256.
Composition and properties of American and European high-yield-strength steels. Table. 16 ref. (ST)

193-V. (Dutch.) **Working and Processing of Aluminum.** A. Jager. *Bedrijf en Techniek,* v. 9, no. 200, Apr. 24, 1954, p. 199-203.
Properties and use of various alloying elements for different applications. Table. (Al)

194-V. (German.) **Titanium.** A. Von Zeerleder. *Metall,* v. 8, nos. 9-10, May 1954, p. 347-351.
Historical review. Reduction of titanium compounds, current research, properties and application. Diagrams, tables. 14 ref. (Ti)

195-V. The Coming Role of Titanium. R. W. Hanzel. *Consulting Engineer,* v. 3, May 1954, p. 56-59.
Commercial forms, mechanical and physical properties, general information on future. Tables. (Ti)

196-V. The Metalloid Germanium. Norman Clarke Jones. *Industrial Chemist and Chemical Manufacturer,* v. 30, May 1954, p. 229-230.
Extraction, properties and applications. Photograph. (Ge)

197-V. Application of Bronze Bearing Alloys. James L. Duchene. *Iron and Steel Engineer,* v. 31, May 1954, p. 92-97.
Considers fatigue strength, embeddability, conformability, seizure resistance, corrosion resistance and method of manufacture. Photographs, micrographs. (T7, Cu)

198-V. Wrought Aluminum Alloys. *Metal Progress,* v. 65, June 1954, p. 112-B.

Table of compositions, properties and designations of commercial alloys. (Al)

199-V. Modern Stainless Steels. Robert H. Aborn. *Metal Progress,* v. 65, June 1954, p. 115-125.

Corrosion evaluation, chemical and mechanical properties, uses and extrusion. Photograph, graphs, micrographs, diagrams. (SS)

200-V. Western Products Utilize Brass Forgings for High Strength, Machinability. *Western Metals,* v. 12, May 1954, p. 56-60.

Production of products which require high corrosion resistance, good machinability and finish; ease of fabrication and a range of strength, toughness and other physical characteristics. Photographs.
(T general, P general, Q general, Cu)

201-V. (German and French.) **Titanium.** *Pro-Metal,* v. 6, no. 38, Apr. 1954, p. 322-333.

Deposits, properties, production and applications. Tables, graphs, photographs. (Ti)

202-V. (Book.) **Carbide Seminar Reports.** Lee N. Gulick, editor. University of Pennsylvania, Philadelphia 4, Pa. $3.00.

Economics of carbide in tool fabrication and maintenance; single point tooling results; new carbide applications such as milling, gun drilling, and trepanning; and detailed data on heat, impact, and corrosion resistance. (G17, C-n)

203-V. Heavy Alloy in Full Production. *Engineering,* v. 177, May 21, 1954, p. 670-671.

Properties, production and uses of tungsten-base G.E.C. alloy. (W)

204-V. Tool Steel. A. J. Blackwell. *Iron & Steel,* v. 27, June 1954, p. 217-222.

Shop metallurgical control by a small user. Tables, graphs, micrographs, diagrams. (S general, TS)

205-V. Aluminium and Aluminium Alloys. E. G. West. *Sheet Metal Industries,* v. 31, no. 326, June 1954, p. 515-531, 536 + 2 plates.

Availability, specification and use in modern engineering and industrial practice. Graphs, tables, photographs. 32 ref. (Al)

206-V. Fortiweld. H. F. Tremlett. *Welding and Metal Fabrication,* v. 22, June 1954, p. 221-226.

A new development in weldable high-tensile steel. Mechanical properties, heat treatment, machinability, formability, welding behavior and applications. Tables. (AY)

207-V. (French.) **Titanium and Titanium Alloys.** A. Saulnier and R. Syre. *Revue de métallurgie* v. 51 no. 5 May 1954 p. 293-304.

Theoretical principles and mechanical properties. Methods used in developing industrial product. Graphs, micrograph. 2 ref. (Ti)

208-V. (German.) **Rating of Bearing Materials. Summary of Material Characteristics.** H. Stephan. *VDI Zeitschrift des Vereines deutscher Ingenieuer* v. 96 no. 14, May 11, 1954, p. 403-409.

Comparison of tin, antimony, lead, magnesium, aluminum, copper, silver, cadmium and zinc-base alloys. Tables, graphs. 8 ref. (SG-c)

209-V. Aluminum 355. (Heat Treatable Aluminum Casting Alloy). *Alloy Digest, no.* Al-18, July 1954.

Composition, physical constants, properties, heat treatment, machinability, weldability and general characteristics. (Al)

210-V. Berylco 20CR. (Beryllium-Copper). *Alloy Digest, no.* Cu-18, July 1954.

Composition, physical constants, properties, heat treatment, machinability, weldability, corrosion resistance, pickling, high and low-temperature characteristics and general characteristics. (Be, Cu)

211-V. Elektron-TZ6. (High Strength Casting Alloy). *Alloy Digest, no.* Mg-10, July 1954.

Composition, impurities, physical constants, properties, machinability, surface treatment, corrosion resistance and general characteristics. (Zn, Mg)

212-V. AISI-8740. (Nickel-Chromium-Molybdenum Alloy Steel). *Alloy Digest, no.* SA-21, July 1954.

Composition, physical constants, properties, heat treatment, machinability, weldability and general characteristics. (AY)

213-V. Kanthal-A. (Resistance Alloy). *Alloy Digest, no.* SS-16, July 1954.

Composition, physical constants, properties, weldability, corrosion resistance and general characteristics. (SG-q, Cr, Fe)

214-V. Ti-140A. (Titanium-Base Alloy). *Alloy Digest, no.* Ti-5, July 1954.

Composition, physical constants, properties, heat treatment, machinability, workability, weldability, corrosion resistance and general characteristics. (Ti)

215-V. Atlas 93. (Shock Resisting Tool Steel). *Alloy Digest, no.* TS-22, July 1954.

Composition, properties, heat

treatment, machinability and general characteristics. (TS)

216-V. Rock-Drilling With Hard Metals. II. E. J. Sandford and J. R. Wiles. *Alloy Metals Review,* v. 8, June 1954, p. 2-8.

Characteristics of hard metals and production of bits. Micrographs, photographs. (T6, EG-d)

217-V. Cast Alloy Reference Sheet. N. S. Mott. *Chemical Engineering Progress,* v. 50, June 1954, p. 324.

Composition; applications, mechanical and physical properties and corrosion resistance of corrosion and galling-resistant 19-10-3-2-3 chromium-nickel-molybdenum-copper-silicon hardenable alloy. Tables. (SS)

218-V. Alkali Metals: Launched Into a New Era. Marshall Sittig. *Chemical Week,* v. 74, June 26, 1954, p. 47-54.

Physics, chemistry, economics and applications of lithium, sodium, potassium, rubidium and cesium. Photographs, graphs, tables, map. (EG-e, Cs, K, Li, Na, Rb)

219-V. Ductile Iron. G. R. Brophy. *Electrical Manufacturing,* v. 54, July 1954, p. 91-95, 301.

Heat treatment, machinability, mechanical and physical properties, corrosion resistance and applications. Micrographs, photographs, graphs, tables. 3 ref. (CI)

220-V. Titanium Seminar. John Alico. *Light Metal Age,* v. 12, June 1954, p. 16 + 4 pages.

Properties, applications, welding, forming and machining. Photographs. (Ti)

221-V. Titanium Groupings. *Light Metal Age,* v. 12, June 1954, p. 24-25.

Advantages and disadvantages in use, forming and heat treating alpha, alpha-beta, unstable beta and stable beta alloys. Tables. (Ti)

222-V. (Polish.) **Research on Bearing Alloy LCa.** S. Balicki. *Prace Instytutow Ministerstwa Hutnictwa,* v. 6, no. 2, 1954, p. 90-97.

Hardness and friction coefficient of lead-calcium alloy. Production methods. Tables, graphs, micrographs. 11 ref. (Pb)

223-V. Nodular Cast Iron, Its Present Position and Future Prospects as an Engineering Material, With Special Reference to Its Suitability for Crankshafts. S. B. Bailey. *Chartered Mechanical Engineer,* v. 1, Apr. 1954, p. 208-210.

History, properties, casting behavior and applications. (T7, CI)

224-V. The 3Mn Complex—New Titanium Alloy. R. J. Kotfila and C. M. Wayman. *Product Engineering,* v. 25, July 1954, p. 172-174.

Properties, fabrication and future possibilities of titanium-3% manganese alloys. Tables, graph, photograph. (Ti)

225-V. The Place for Vanadium. *Steel,* v. 135, July 12, 1954, p. 128-130.

Mechanical and physical properties, workability and machinability of vanadium and its alloys. Graphs, table. (V)

226-V. (Book.) **The Commercially Important Wrought Copper Alloys.** 124 p. 1953. Chase Brass & Copper Co. Inc., Waterbury 20, Conn.

Properties, uses, forms, and sizes available in copper, brasses and bronzes. (Cu)

227-V. (Book.) **Copper. The Metal, Its Alloys, and Compounds.** Allison Butts, editor. ACS Monograph 122. 936 p. 1954. Reinhold Publishing Corp., 330 W. 42nd St., N. Y. 18. $20.00.

Includes "The background of the Copper Industry", Lawrence Addicks; "Copper Minerals, Ores and Ore Deposits", E. N. Pennebaker; "The Concentration of Copper Ores", Frank L. Bosqui, Donald Dyrenforth and Alexander D. Marriott; "Roasting, Smelting, and Converting", W. B. Boggs; "Anode Furnace Refining", Richard Baier and Michael B. Kushma; "Copper Slags and Mattes", Carle R. Hayward; "Thermodynamics of Copper Smelting", E. A. Peretti; "Electrolytic Copper Refining", C. W. Eichrodt and J. H. Schloen; "Cathode Melting and Casting of Marketed Copper Shapes", R. H. Waddington; "Induction Melting of Copper and Copper Alloys", Manuel Tama; "Treatment of Electrolytic Copper Refinery Slimes", J. H. Schloen and E. M. Elkin; "The Fire Refining of Copper", H. J. Miller; "The Hydrometallurgy of Copper", J. George Grunenfelder; "Commercial Forms of Copper Products", Sidney Rolle; "Copper and Copper-Base Powders", Paul E. Weingart; "Secondary Copper and Copper Alloys", Ray Cochran; "The Physical Properties of Copper", J. S. Smart, Jr.; "Chemical Properties and Corrosion Resistance of Copper and Copper Alloys", P. T. Gilbert; "The Effect of Impurities in Copper", J. S. Smart, Jr.; "The Physical Chemistry of Copper", D. W. Wakeman; "The Isotopes of Copper", John Kronsbein and Ralph H. Firminhac; "Phase Diagrams of Copper Alloy Systems", R. M. Brick; "Magnetic Properties of Copper and Copper Alloys", Allison Butts; "Copper-Base Foundry Alloys", William Romanoff, F. L. Rid-

dell and G. P. Halliwell; "Wrought Copper Alloys", V. P. Weaver; "Copper as an Alloying Element", Webster Hodge; "The Melting and Casting of Copper-Base Alloys", William Romanoff, F. L. Riddell and G. P. Halliwell; "Hot Working of Copper and Copper Alloys", Frank F. Poland; "Cold Working of Copper and Copper Alloys", W. T. Toussaint; "Heat Treatment of Copper and Copper-Base Alloys", E. M. Manning; "Machining Characteristics of Wrought Copper and Copper Alloys", Henry Burghoff; "Welding, Brazing, Soldering, and Cladding of Copper and Its Alloys", A. N. Kugler; "Production and Use of Copper", D. K. Crampton; "Copper and Copper Alloys in the Electrical Industry", I. V. Williams; "Copper in the Building Industry", T. E. Veltfort; "Automotive Applications of Copper and Copper Alloys", E. W. Upham; "The Use of Copper and Copper Alloys in Ordnance", A. L. Jamieson; "Copper and Copper-Zinc Alloy Plating", A. Kenneth Graham; "The Simpler Inorganic Compounds of Copper", A. J. Barnard, Jr.; "Copper as an Agricultural Fungicide", J. D. Wilson; "Cupreous Powder and Its Applications", Dean S. Hubbell; "Copper in Organic Chemistry", Robert A. Benkeser and Henry Gilman; "Copper in Biology", Francis F. Heyroth and Jacob Cholak; "Copper in the Production and Nutritional Quality of Crops", Kenneth C. Beeson; "Metallography of Copper and Its Alloys", Franklin H. Wilson; and "The Analytical Chemistry of Copper", E. Leininger. (Cu)

228-V. (Book.) **Titanium and Titanium Alloys.** John L. Everhart. 184 p. 1954. Reinhold Publishing Corp., 330 W. 42nd St., New York 18. $3.00.

Properties of commercial titanium and its alloys, heat treatment, forming and fabricating, joining, machining and grinding, cleaning and finishing, and applications. (Ti)

229-V. Spheroidal-Graphite Iron. *Aircraft Production,* v. 16, July 1954, p. 266-267.

Properties and production characteristics. Photographs, tables. (CI)

230-V. Indium. Its Properties and Uses. A. F. Cadenhead. *Canadian Metals,* v. 17, June 1954, p. 16, 18.

Mechanical and physical properties. Uses as constituent of bearing metal, low melting point and glass sealing alloys. (In)

231-V. Properties and Applications of Ductile Iron. *Consulting Engineer,* v. 4, July 1954, p. 46-49, 76.

Includes specifications, materials replaced and advantages. Photographs, micrographs, tables. 23 ref. (CI)

232-V. The Selection of Constructional Steels. ASM Committee on Carbon and Alloy Steels. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 1 + 25 pages.

Engineering considerations, compositions, mechanical properties and hardenability of hot rolled, cold drawn, low alloy and hardenable steels. Tables, graphs. (CN, AY)

233-V. The Selection of Tool Steels. ASM Committee on Tool Steels. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 21-33.

Designations, compositions, applications, heat treatment and mechanical properties. Tables, graphs. (TS)

234-V. Stainless Steels. ASM Committee on Stainless Steel. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 34-41.

Compositions, mechanical and physical properties, production statistics, working characteristics, heat treatment, welding procedures and corrosion resistance. Tables, graphs. (SS)

235-V. Nodular Cast Iron. ASM Committee on Nodular Iron. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 49-52.

Processing; structure; mechanical and physical properties; oxidation resistance; machinability; applications. Tables, micrographs, graphs. (CI)

236-V. Applications of Aluminum and Aluminum Alloys. ASM Committee on Aluminum. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 52-63.

Applications in aircraft, automobiles, railroads, electrical appliances and chemical equipment. Mechanical, physical and corrosion properties. Fabrication procedures. Diagram, tables, graphs. (T general, P general, Q general, R general, Al)

237-V. Selection of Copper Alloys. ASM Committee on Copper. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 64-72.

Mechanical and physical properties, processing characteristics and corrosion resistance of wrought and cast forms. Tables. (Cu)

238-V. Magnesium and Magnesium Alloys. ASM Committee on Magnesium. *Metal Progress,* v. 66, no. 1-A July 15, 1954, p. 73-79.

Production; uses; processing; finishing; cathodic protection. Mechanical and physical properties. Graphs, tables. (Mg)

239-V. Titanium and Titanium Alloys. ASM Committee on Titanium. *Metal Progress,* v. 66, no. 1-A, July 15, 1954, p. 80-89.

Production of ingots; forming; machining; welding; heat treating; cleaning and finishing; metallography. Corrosion resistance; mechanical and physical properties. Applications. Tables, micrographs, graphs. (Ti)

240-V. New Steel Passes Toughness Test. Allen G. Gray. *Steel,* v. 135, July 19, 1954, p. 102-103.

Composition, properties and applications of Carilloy T-1. Photographs, tables. (AY)

241-V. (German.) **Alloys of Extremely Low Melting Points.** A. Keil. *Metall,* v. 8, nos. 13-14, July 1954, p. 515-518.

Properties and application of binary, ternary and quaternary alloys of bismuth, cadmium, lead, tin and indium as soft solders. Diagrams, micrographs, graph. 7 ref. (K8, T5, SG-d)

242-V. Ternalloy 7. Age-Hardenable Aluminum Alloy. *Alloy Digest,* no. Al-19, Aug. 1954.

Composition, physical and mechanical properties, heat treatment, castability, machinability, weldability, corrosion resistance and applications. (Al)

243-V. ArmaSteel. Malleablized Iron. *Alloy Digest,* no. Cl-7, Aug. 1954.

Composition, physical and mechanical properties, heat treatment, machinability, weldability and applications. (CI)

244-V. Federaloy F-1. Bearing Bronze. *Alloy Digest,* no. Cu-19, Aug. 1954.

Composition, physical and mechanical properties, castability, machinability, weldability, corrosion resistance and applications. (Cu)

245-V. Domal AZ91X. Sand Casting, Permanent Mould, and Die Casting Alloy. *Alloy Digest,* no. Mg-11, Aug. 1954.

Composition, physical and mechanical properties, castability, machinability, heat treatment, corrosion resistance and applications. (Mg)

246-V. C.D.C. Manganese Alloy No. 780. Manganese-Copper Alloy. *Alloy Digest,* no. Mn-2, Aug. 1954.

Composition, physical and mechanical properties, machinability, workability, weldability and applications. (Mn, Cu)

247-V. Donegal DC-50. Precipitation-Hardening Cast Alloy. *Alloy Digest,* no. SS-17, Aug. 1954.

Composition, physical and mechanical properties, machinability, castability, weldability, corrosion resistance, pickling and cleaning and applications. (SS)

248-V. Vega. Air-Hardening Tool and Die Steel. *Alloy Digest,* no. TS-23. Aug. 1954.

Composition, physical and mechanical properties, heat treatment, machinability, workability, weldability and applications. (TS)

249-V. The Properties and Uses of Spheroidal Graphite Cast Iron. *Mechanical World and Engineering Record,* v. 134, July 1954, p. 297-299.

Mechanical and physical properties, castability. Applications replacing steel castings or forgings. Tables. (CI)

250-V. Facts Concerning White Metal Bearings. Howard Warburton. *Mechanical World and Engineering Record,* v. 134, July 1954, p. 309-311.

Physical and mechanical properties; bearing failures and methods of improvement.
(T7, P general, Q general, SG-c)

251-V. (German.) **New Aluminum-Tin Bearing Alloys.** B. Keysselitz. *Aluminium,* v. 30, no. 7, July 1954, p. 288-290.

Alloys of aluminum with 20 to 30% tin provide bearing material that will withstand high pressure and provide smooth running with steel shafts. Photographs, micrographs, table. 2 ref. (T7, Al, Sn)

252-V. (German.) **Hard Manganese Cast Steel.** E. Piwowarsky and H. L. Roes. *Giesserei,* v. 41, no. 14, July 8, 1954, p. 357-369.

Effects of addition elements on foundry practice, mechanical properties and phase transformations. Tables, graphs, micrographs, photographs, diagrams. 1 ref.
(E general, Q general, N general, CI, AY)

253-V. (German.) **Vanadium. Natural Deposits of a Technically "Young" Metal.** H. Bachmann. *Umschau in Wissenschaft und Technik,* v. 54, no. 14, July 15, 1954, p. 425-426.

Geology of ores, properties and applications of the metal and its alloys. Photographs, micrograph. (V)

254-V. (Book—German.) **(Alumina and Aluminum.) Tonerde und Aluminium. v. II. (Aluminum.) Das Aluminium.** Wilhelm Fulda and Hans Ginsberg. 385 p. 1953. Walter de Gruyter & Co., Berlin, W. 35. $11.00.

Results and experiences of industrial practice, 1920-1952. (Al)

255-V. (Book—German.) **(Gmelin's Handbook of Inorganic Chemistry. System no. 9. Sulfur. Part A, Section 3.) Gmelins Handbuch der anorganischen Chemie.** E. H. E. Pietsch, editor. 8th Ed. 252 p. 1953. Verlag Chemie, GmbH., Weinheim—Bergstrasse, West Germany. $34.00.

Physics and chemistry of elemental sulfur, including electrochemistry and behavior in presence of various substances. (S)

256-V. (Book—German.) **(Gmelin's Handbook of Inorganic Chemistry. System no. 10. Selenium. Part A, Section 3.) Gmelins Handbuch der anorganischen Chemie.** E. H. E. Pietsch, editor. 8th Ed. 184 p. 1953. Verlag Chemie, GmbH., Weinheim—Bergstrasse, West Germany. $26.64.

Properties, theory, manufacture and applications of selenium rectifiers and photocells. (Se)

257-V. (Book—German.) **(Gmelin's Handbook of Inorganic Chemistry. System no. 13. Boron Supplement Volume.) Gmelins Handbuch der anorganischen Chemie.** E. H. E. Pietsch, editor. 8th Ed. 253 p. 1954. Verlag Chemie, GmbH., Weinheim—Bergstrasse, West Germany. $33.60.

Occurrence, structure and properties of boron and its compounds. (B)

258-V. (Book—German.) **(Gmelin's Handbook of Inorganic Chemistry. System no. 62. Gold. Sections 2 and 3.) Gmelins Handbuch der anorganischen Chemie.** E. H. E. Pietsch, editor. 8th Ed. 306 and 558 p. 1954. Verlag Chemie, GmbH., Weinheim—Bergstrasse, West Germany. $40.32 and $74.88.

Section 2 covers history; occurrence; extractive and physical metallurgy. Formation and preparation of special modifications in pure state, such as colloidal gold. Surface treatment of gold and gold alloys. Section 3 includes properties, electrochemical and chemical behavior, structure and analysis of gold, its alloys and compounds. (Au)

259-V. Columbium Vital in Jet Engine Production. A. F. Cadenhead. *Canadian Metals,* v. 17, July 1954, p. 16, 18.

Occurrence, sources, properties, uses, annual production and price of columbium. Photograph.
(T25, Cb)

260-V. Phosphor Bronzes. *Copper & Brass Bulletin,* 1954, Aug., no. 169, p. 8-9.

Compositions, advantages and applications. Table. (Cu)

261-V. Zirconium—How It Is Fabricated. *Light Metal Age,* v. 12, Aug. 1954, p. 16-17, 32, 37.

Forging, rolling, welding, joining, grinding, machining, extruding, drawing, annealing, cleaning and finishing. Photograph.
(F general, G general, Zr)

262-V. Borides and Aluminides. New Refractory Hard Metals. John L. Everhart. *Materials & Methods,* v. 40, Aug. 1954, p. 90-92.

Mechanical, physical and corrosion properties of zirconium, chromium and molybdenum borides and nickel aluminide. Photographs, table. (EG-d)

263-V. Ingot Iron and Wrought Iron. *Materials & Methods,* v. 40, Aug. 1954, p. 127.

Tabulated mechanical and physical properties, corrosion resistance, available forms and uses. (Fe)

264-V. Improved Aluminium-Tin Bearing Alloys. J. W. Cuthbertson and E. C. Ellwood. *Metal Industry,* v. 85, July 30, 1954, p. 83-86.

Metallography, forging, heat treatment, bonding and mechanical properties. Graphs, diagram, table, micrographs. 4 ref. (Sn, SG-c)

265-V. Modern Trends in Brasses. Arthur H. Allen. *Metal Progress,* v. 66, Aug. 1954, p. 106-110.

Effects of additions on properties. Characteristics of high-strength bronzes. Photographs, graph, table. (Cu)

266-V. Zirconium. J. H. Keeler. *Product Engineering,* v. 25, Aug. 1954, p. 183-187.

Variables to be considered in study of strength and ductility. Tables, graphs, micrographs, diagrams. 9 ref. (Zr)

267-V. Melting and Fabrication of Zirconium. J. W. Holladay and J. G. Kura. Paper from "Nuclear Engineering. Pt. I.", American Institute of Chemical Engineers, p. 23-30.

Arc-melting techniques. Rolling, extrusion, drawing, machining and joining. Properties and applications. Tables. 31 ref. (Zr)

268-V. Preparation, Properties, and Uses of Beryllium. E. J. Boyle and J. L. Gregg. Paper from "Nuclear Engineering. Pt. I.", American Institute of Chemical Engineers, p. 53-56.

Reduction, melting, crushing, hot pressing and extrusion and mechanical properties. Photographs, tables. 8 ref. (Be)

269-V. Thorium Metallurgy. J. R. Keeler. Paper from "Nuclear Engineering. Pt. I", American Institute of Chemical Engineers, p. 57-61.
Production, working, physical and mechanical properties. Alloy systems. Tables, graphs. 5 ref. (Th)

270-V. Metallurgy of Uranium. H. A. Saller and F. A. Rough. Paper from "Nuclear Engineering. Pt. I.", American Institute of Chemical Engineers, p. 63-67.
Ores, refining, fabrication, alloying. Physical properties. Tables, phase diagrams. 9 ref. (U)

271-V. (Dutch.) **Copper and Copper Alloys. XIV. Special Brass.** W. G. R. De Jager, *Metalen,* v. 9, no. 13, July 15, 1954, p. 208-210.
Effects of tin, manganese, iron, aluminum, nickel, silicon and lead in various combinations with copper and zinc. Tables. 14 ref. (Cu, Zn)

272-V. (French.) **Centenary of Aluminum 1854-1954. Remarks on the French Aluminum Industry.** *Métaux, Corrosion-Industries,* v. 29, no. 346, June 1954, p. 259-267.
History, production, uses and markets. Map, photograph. (Al)

273-V. High Alloy Castings and Their Applications. II. *Industrial Heating,* v. 21, Aug. 1954, p. 1534 + 5 pages.
Oxidation, corrosion resistance at high temperatures and effects of hot wear. Applications. Photographs. (R general, T general, SS, SG-h)

274-V. Production and Hot Working of Titanium. *Industrial Heating,* v. 21, Aug. 1954, p. 1551-1552, 1554.
Reduction, properties and heat treatment. Problems remaining to be solved.
(C general, F general, J general, Ti)

275-V. The Platinum-Group Metals. John Cochrane. *Journal of Chemical Education,* v. 31, Aug. 1954, p. 407-409.
Production and metallurgy. Tables. (Pt, Os, Ir, Rh, Pd, Ru)

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277-V. Stainless Steels in Brief. I. Roles of the Common Alloys. Richard E. Paret. *Steel Processing,* v. 40, Aug. 1954, p. 500-504.
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Structure, properties, production. Tables, photographs. 32 ref.
(Ca, Ba, Sr)

280-V. Beryllium. Bengt R. F. Kjellgren. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 31-55.
History, metallurgy, properties, uses. Tables. 24 ref. (Be)

281-V. Bismuth. Herbert E. Howe. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 57-69.
Occurrence, production, properties. Tables. 22 ref. (Be)

282-V. Boron. Hugh S. Cooper. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 71-86.
Occurrence, production, properties, applications. Micrographs, diagram, photographs. 68 ref. (B)

283-V. Cadmium. F. G. McCutcheon and John R. Musgrave. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 87-103.
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284-V. Cobalt. C. R. Whittemore. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 105-146.
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286-V. Germanium. H. R. Harner. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 161-172.
Extraction, properties, alloys, applications. Table. 63 ref. (Ge)

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History, production, properties, applications. Tables, photographs. 84 ref. (Hf)

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History, production, properties, applications. Alloys. Diagrams, tables. 144 ref. (Li)

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Occurrence, metallurgy, properties, working. Photographs, tables. 15 ref. (Mo)

292-V. The Platinum Metals. F. E. Beamish, W. A. E. McBryde and R. R. Barefoot. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 291-328.
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293-V. Rare Earth Metals. Howard E. Kremers. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 329-346.
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Metallurgy, properties, applications. Table, diagrams. 82 ref. (Re)

295-V. Selenium. John R. Stone and Peter E. Caron. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 365-377.
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296-V. Silicon. Donald W. Lyon. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 379-388.
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297-V. Tantalum and Columbium. Leonard F. Yntema and Allan L. Percy. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 389-404.
Extraction, properties, metallography, fabrication and applications. Photographs, tables. 9 ref. (Cb, Ta)

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Metallurgy, properties, toxicity, applications. Tables. 11 ref. (Te)

299-V. Thallium. Herbert E. Howe. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 417-428.
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300-V. Thorium. William C. Lilliendahl. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 429-454.
Ore purification, metallurgy, properties, melting, applications. Tables, diagrams, photographs. 84 ref. (Th)

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Occurrence, production, metallurgy, properties, alloys, applications. Tables, micrographs, graphs, phase diagrams. 22 ref. (Ti)

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Ores, metallurgy, working, properties, fabrication, applications. Photographs, tables. 9 ref. (W)

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History, properties, metallurgy, structure, reactions, alloys. Tables, diagrams, graphs, flow sheets, micrographs. 389 ref. (U)

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Heat treatment, mechanical properties and transformations of copper, silicon, magnesium and zinc alloys. (Al, Cu, Zn, Mg)

307-V. (French.) **Working of Aluminum.** *Revue de l'Aluminium*, v. 31, no. 211, June 1954, p. 192-200.
Casting methods, drawing, pressing, forging, welding, anodic oxidation, electrolytic and chemical polishing and painting. Photographs. (Al)

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Composition, physical characteristics, mechanical properties, heat treatment, machinability and weldability. (Al)

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Properties, geology, mineralogy, production and consumption, metallurgy, and uses. Tables, diagram, maps, graph. 187 ref. (Se)

316-V. Investigation of Nickel-Aluminum Alloys Containing From 14 to 34 Per Cent Aluminum. W. A. Maxwell and E. M. Grala. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3259, Aug. 1954, 42 p.
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317-V. (German.) **The Active Substance Beryllium.** Wilhelm von Haken. *Chemische Industrie,* v. 6, no. 8, Aug. 1954, p. 445-447.
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318-V. (German.) **The Importance of Precious Metals in Modern Materials Development.** K. Ruthardt. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 591-596.
Mechanical, physical and chemical properties, applications. Photographs, tables. (T general, EG-c)

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321-V. (Book.) **The Structure and Properties of Mild Steel.** C. A. Edwards. 154 p. 1953. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. $4.00
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322-V. Corrosion Resistant Aluminium Bronze. R. J. T. Caney. *Australasian Engineer,* 1954, June, p. 54-69.
Composition, structure and properties of acid resistant alloys. Tables, graphs, micrographs. 10 ref. (Cu)

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325-V. Ductile Iron Meets Heavy Duty Service Requirements. D. M. Marsh. *Iron Age,* v. 174, Sept. 9, 1954, p. 135-138.
Improved process control widens range of physical properties and permits its use in casting heavy duty

machinery. Photographs, tables, graph. (Q general, T5, CI)

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329-V. Aluminum in France. T. L. Fritzlen. *Metal Progress,* v. 66, Sept. 1954, p. 113-114.
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Results of tests on forming, welding, machining and annealing of commercially pure titanium sheet. Photographs. (Ti)

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Properties, casting, and machining of zinc alloys. Applications in machine parts, consumer goods and sheetmetal shaping dies. Tables, micrographs, photographs, diagram. 13 ref. (T general, Zn)

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334-V. New Sulfur-Bearing Tool Steels—a New Materials Preview. *Materials & Methods,* v. 40, Sept. 1954, p. 96-97.
Properties and machining characteristics. Photographs. (G17, TS)

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Alloy possesses good mechanical properties and weldability. Photograph. (Q general, K9, Al)

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344-V. (Book.) **New High-Temperature Intermetallic Materials.** Report

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Refining problems, properties and applications. Photograph. (Ti)

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Comparison of cold rolled versus hot rolled sheets. Fabrication, properties, structure, performance characteristics. Micrographs, graphs, photograph. (SG-p, ST)

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Performance factors on pure metals, true alloys, silver semi-refractory compacts and compositions of refractory metals with silver or copper. Properties and applications. Tables, photographs. (T1, SG-r)

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349-V. Good Commercial Nodular Irons Rival Steel in Strength, Ductility. Richard Schneidewind. *SAE Journal,* v. 62, Oct. 1954, p. 94-96.

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350-V. Tool Steels for Plastic Molds. Hugo G. Becker. *SPE Journal,* v. 10, Oct. 1954, p. 19-27, 43.

Advantages, costs, production, applications. Tables, graphs, micrographs, photographs. (T29, TS)

351-V. Non-Ferrous Metals: Physical Metallurgy. T. Ll. Richards, G. K. Williamson and D. E. Yeomans. Paper from "Reports on the Progress of Applied Chemistry". Society of Chemical Industry, p. 208-221.

Progress in British studies of mechanical properties, recovery and recrystallization and constitution and structure of alloys. 184 ref. (EG-a)

352-V. (German.) The Plain Carbon Toolsteels. Franz Rapatz and Otto Mirt. *Stahl und Eisen,* v. 74, no. 19, Sept. 9, 1954, p. 1195-1202.

Compares compositions and properties of steels used in various countries. Effects of silicon and aluminum on hardenability and quench cracking. Tables, micrographs, graphs, photographs. 25 ref. (J26, TS)

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Development of existing applications and new products for the process and other industries. Photograph. 135 ref. (T29, Al)

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Significant developments and data accumulated during past 3 yr. Photograph. 11 ref. (T29, Cu)

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tics and significance in industrial problems. 200 ref. (T29, Ni)

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Literature review of 1954 on titanium, molybdenum, zirconium and tantalum as materials of construction. Photograph. 35 ref. (T29, Ti, Mo, Zr, Ta)

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Development of Fortiweld (low-alloy, boron-molybdenum) steel from 1949 to 1953. Effects of composition and heat treatment on mechanical properties. Tables, graphs. (Q general, K general, AY)

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Composition, physical and mechanical properties and processing data. (CI)

366-V. Berylco 165. Heat Treatable Beryllium Copper Wrought Alloy. *Alloy Digest,* no. Cu-20, Nov. 1954.

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369-V. AISI 4130. Chromium-Molybdenum Alloy Steel. *Alloy Digest,* no. SA-4130, Nov. 1954.

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Composition, mechanical properties, heat treating and machinability. (TS)

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Factors involved for various grades of steel. (ST)

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Data sheets of physical and mechanical properties. (Pb)

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Composition, physical and mechanical properties of three alloys. Photographs, table. (E general, Cu)

378-V. (Book.) **Chemistry of the Lanthanons.** R. C. Vickery. 296 p. 1953. Academic Press Inc., 125 E. 23rd St., New York 10, N. Y. $6.00.

History; occurrence; structure; separation techniques, properties; analytical methods, and applications of the elements whose atomic numbers range from 57 to 71. (EG-g)

379-V. (Book.) **The Light Metals Handbook.** George A. Pagonis. v.

I-II. 199 and 185 p. 1954. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York 3, N. Y. $8.50.

Volume I contains text, and volume II tabular data on aluminum and magnesium-base alloys. Includes analyses, chemical reaction characteristics, mechanical properties, heat treatment, casting and forming characteristics, and joining methods. (Al, Mg)

380-V. (Book) **Ultra High Strength Steels in Aircraft Applications.** 73 p. 1953. Society of Automotive Engineers, Inc., 29 West 39th Street, New York 18, N. Y.

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(T24, Q general, AY)

ADDRESSES OF PUBLICATIONS

I. ENGLISH-LANGUAGE JOURNALS AND SERIALS

A

ACI Proceedings, American Concrete Institute, 18263 W. McNichols Rd., Detroit 19, Mich.

Acoustical Society of America, Journal, American Institute of Physics, Prince and Lemon St., Lancaster, Pa., or 57 East 55th St., New York 22, N. Y.

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Adhesives & Resins, A. S. O'Connor & Co. Ltd., 329 Gray's Inn Road, London, W.C. 1, England.

Advances in Physics, Taylor & Francis, Ltd., Red Lion Court, Fleet St., London, E.C. 4, England.

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Aeronautical Engineering Review, Institute of Aeronautical Sciences, Inc., 2 East 64th St., New York 21, N. Y. or 7660 Beverly Blvd., Los Angeles, Calif.

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Aircraft Engineering, Bunhill Publications Ltd., 12 Bloomsbury Square, London, W.C. 1, England.

Aircraft Production, Iliffe & Sons, Ltd., Dorset House, Stamford St., London, S.E. 1, England.

Alloy Digest, Engineering Alloys Digest, Inc., P. O. Box 156, Upper Montclair, N. J.

Alloy Metals Review, High Speed Steel Alloys Ltd., Widnes, Lancashire, England.

American Ceramic Society Bulletin, 2525 N. High St., Columbus 2, Ohio.

American Ceramic Society, Journal, 2525 N. High St., Columbus 2, Ohio.

American Chemical Society, Journal, 1155 Sixteenth St., N.W., Washington 6, D. C.

American Concrete Institute, Journal, 18263 W. McNichols Rd., Detroit 19, Mich.

American Cyanamid Company, Mineral Dressing Notes, 30 Rockefeller Plaza, New York 20, N. Y.

American Foundryman, American Foundrymen's Society, Inc., Golf & Wolf Roads, Des Plaines, Ill.

American Foundrymen's Society, Preprints, Golf & Wolf Roads, Des Plaines, Ill.

American Gas Association Monthly, American Building, Brattleboro, Vt. or 420 Lexington Ave., New York 17, N. Y.

American Institute of Mining and Metallurgical Engineers, Transactions, 29 West 39th St., New York 18, N. Y.

American Iron and Steel Institute, Preprints, 350 Fifth Ave., New York 1, N.Y.

American Journal of Physics, American Institute of Physics, 57 East 55th St., New York 22, N. Y.

American Machinist, 330 West 42nd St., New York 36, N. Y.

American Oil Chemists' Society, Journal, 35 E. Wacker Drive, Chicago 1, Ill.

American Paint Journal, 2911 Washington Ave., St. Louis 3, Mo.

American Petroleum Institute, Proceedings, 50 West 50th St., New York 20, N.Y.

American Power Conference, Proceedings, Illinois Institute of Technology, Chicago, Ill.

American Railway Engineering Association, Bulletin, 2211 Fordem Ave., Madison, Wis.

American Society of Mechanical Engineers, Transactions, 29 West 39th St., New York 18, N. Y.

American Society for Metals, Transactions, 7301 Euclid Ave., Cleveland 3, Ohio.

American Society of Naval Engineers, Journal, 605 F St., N.W., Washington 4, D. C.

American Society for Testing Materials, Preprints, 1916 Race St., Philadelphia 3, Pa.

American Society of Tool Engineers, Technical Papers and Panel Discussions, 10700 Puritan Ave., Detroit 21, Mich.

American Statistical Association Journal, 450 Ahnaip St., Menasha, Wis., or 1108 Sixteenth St., N.W., Washington 6, D. C.

American Water Works Association, Journal, 521 Fifth Ave., New York 17, N. Y.

American Zinc Institute, Journal, 60 East 42nd St., New York 17, N. Y.

Analysts Journal, National Federation of Financial Analysts Societies Headquarters, Room 903-C, 270 Park Ave., New York 17, N. Y.

Applications and Industry, American Institute of Electrical Engineers, 33 West 39th St., New York 18, N. Y.

Applied Hydraulics, 1240 Ontario St., Cleveland 13, Ohio.

Applied Mechanics Reviews, American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y.

Applied Scientific Research, Martinus Nighoff, The Hague, Netherlands.

ASME Transactions, American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y.

ASTM Bulletin, American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

Australasian Engineer, 20 Loftus St., Sydney, Australia.

Australian Journal of Physics, Commonwealth Scientific and Industrial Research Organization, 31 Albert St., East Melbourne, C. 2, Victoria, Australia.

Automobile Engineer, Iliffe & Sons., Ltd. Dorset House, Stamford St., London, S.E. 1, England.

Automotive Industries, Chilton Co., Chestnut and 56th Sts., Philadelphia 39, Pa.

Aviation Age, Conover-Mast Publications, Inc., 205 East 42nd., New York 17, N. Y.

Aviation Week, 330 West 42nd St., New York 36, N. Y.

B

Bakelite Review, Bakelite Co., 30 East 42nd St., New York 17, N. Y.

Battelle Technical Review, Battelle Memorial Institute, 505 King Ave., Columbus 1, Ohio.

Bell Laboratories Record, Bell Telephone Laboratories, Inc., 463 West St., New York 14, N. Y.

Bell System Technical Journal, American Telephone and Telegraph Co., 195 Broadway, New York 7, N. Y.

Birmingham Metallurgical Society, Journal, 253 Longbridge Lane, Northfield, Birmingham 31, England.

Blast Furnace and Steel Plant, Steel Publications, Inc., 4 Smithfield St., Pittsburgh 30, Pa.

Bookbinding & Book Production, 3110 Elm Ave., Baltimore 11, Md.

British Cast Iron Research Association, Journal of Research and Development, Alvechurch, Birmingham, England.

British Journal of Applied Physics, Institute of Physics, 47 Belgrave Square, London, S.E. 1, England.

British Printer, Wellington House, 125/130 Strand, London, W.C. 2, England.

British Steelmaker, 7 Chesterfield Gardens, Mayfair, London, W. 1, England.

British Welding Journal, Institute of Welding, 2 Buckingham Palace Gardens, London, S.W. 1, England.

Brown Boveri Review, Brown Boveri & Co., Ltd., Baden, Switzerland.

Bureau of Ships Journal, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Business Week, 330 W. 42nd St., New York 36, N. Y.

C

Canadian Business, Canadian Chamber of Commerce, 524 Board of Trade Bldg., Montreal, Canada.

Canadian Chemical Processing, Hugh C. Maclean Publications Ltd., Box 4000, Terminal A, Toronto 1, Canada.

Canadian Journal of Chemistry, Division of Administration, National Research Council, Ottawa 2, Canada.

Canadian Journal of Physics, Division of Administration, National Research Council, Ottawa 2, Canada.

Canadian Journal of Technology, Division of Administration, National Research Council, Ottawa 2, Canada.

Canadian Metals, Hugh C. MacLean Publications Ltd., Box 4000, Terminal A, Toronto 1, Canada.

Canadian Mining Journal, Gardenvale, Quebec, Canada.

Canadian Mining and Metallurgical Bulletin, Canadian Institute of Mining and Metallurgy, 911 Drummond Bldg., Montreal, Quebec, Canada.

Canadian National Research Council, Technical Information Service, Ottawa, Canada.

Castings Research Laboratory Report, Waseda University, Tokyo, Japan.

Central Electrochemical Research Institute, Karaikudi, Bulletin, Central Electrochemical Karaikudi, India.

Ceramic Age, Ceramics Publishing Co., Inc., 421 Parker St., Newark 4, N. J.

Ceramic Industry, Industrial Publications, Inc., 5 South Wabash Ave., Chicago 3, Ill.

Chartered Mechanical Engineer, Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, S.W. 1, England.

Chemical Age, Bouverie House, 154 Fleet St., London, E.C. 4, England.

Chemical Engineering, 330 West 42nd St., New York 36, N. Y.

Chemical Engineering Costs Quarterly, Industrial Research Service, Dover, N.H.

Chemical Engineering and Mining Review, Tait Publishing Co., Pty. Ltd., 349 Collins St., Melbourne, Australia.

Chemical and Engineering News, American Chemical Society, 1155 Sixteenth St., N.W., Washington 6, D. C.

Chemical Engineering Progress, American Institute of Chemical Engineers, 120 East 41st St., New York 17, N. Y.

Chemical & Process Engineering, Leonard Hill Ltd., Stratford House, 9 Eden St., London, N.W. 1, England.

Chemical Processing, 111 East Delaware Place, Chicago 11, Ill.

Chemical Society, Annual Reports, Burlington House, London, W. 1, England.

Chemical Society, Journal, Burlington House, London, W. 1, England.

Chemistry, American Institute of Chemists, Inc., 60 East 42nd St., New York 17, N. Y.

Chemistry in Canada, Chemical Institute of Canada, 18 Rideau St., Ottawa, Canada.

Chemistry & Industry, Society of Chemical Industry, 56 Victoria St., London, S.W. 1, England.

Coke and Gas, Tothill Press, Ltd., 33 Tothill St., Westminster, London, S.W. 1, England.

Combustion, Combustion Publishing Co., Inc., 200 Madison Ave., New York 16, N. Y.

Communications and Electronics, American Institute of Electrical Engineers, 33 West 39th St., New York 18, N. Y.

Consulting Engineer, Industry and Power Publishing Co., 420 Main St., St. Joseph, Mich.

Copper & Brass Bulletin, Copper & Brass Research Association, 420 Lexington Ave., New York 17, N. Y.

Corrosion, National Association of Corrosion Engineers, 1061 M & M Building, No. 1 Main St., Houston 2 Tex.

D

Diesel Power, Diesel Publications, Inc., 192 Lexington Ave., New York 16, N.Y.

Down to Earth, Dow Chemical Co., Midland, Mich.

Draht (English Ed.), Prost & Meiner-Verlag, (13a) Coburg/Ofr, Bahnhofstrasse 31, Germany.

Drilling, Associated Publishers, Inc., 2115 N. St. Paul St., Dallas 1, Tex.

E

Economic Geology, Economic Geology Publishing Co., Urbana, Ill.

Edgar Allen News, Edgar Allen Steel Co. Div., A. Milne & Co., 741-3-5 Washington St., New York, N. Y.

Electric Furnace Steel Proceedings, American Institute of Mining and Metallurgical Engineers, 29 West 39th St., New York 18, N. Y.

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Electrochemical Society, Journal, 216 West 102nd St., New York 25, N. Y.

Electrodepositors' Technical Society, Journal, 27 Islington High St., London, N. 1, England.

Electronic Engineering, 28 Essex St., Strand, London, W.C. 2, England.

Electroplating and Metal Finishing, 85 Udney Park Rd., Teddington, Middlesex, England.

Electrotypers and Stereotypers, Journal, Stonhill & Gillis Ltd., 329 High Holborn, London, W.C. 1, England.

Endeavour, Imperial Industries, Ltd., North Block, Thames House, Millbank, London, S.W. 1, England.

Engineer, 28 Essex St., Strand, London, W.C. 2, England.

Engineering, 35-36 Bedford St., Strand, London, W.C. 2, England.

Engineering Journal, Engineering Institute of Canada, 2050 Mansfield St., Montreal, Quebec, Canada.

Engineering and Mining Journal, 330 West 42nd St., New York 36, N. Y.

Engineers' Digest, 120 Wigmore St., London, W. 1, England, or 366 Madison Ave., New York 17, N. Y.

Ericsson Review, Hemming Johansson, Esselte AB, Stockholm, Sweden.

F

Factory Management and Maintenance, 330 West 42nd St., New York 36, N. Y.

Faraday Society, Transactions, The Aberdeen University Press, Ltd., 6 Upper Kirkgate, Aberdeen, Scotland.

Finish, Dana Chase Publications, York St. and Park Ave., Elmhurst, Ill.

Flow, 1240 Ontario St., Cleveland 13, Ohio.

Food Technology, Institute of Food Technology, 176 West Adams St., Chicago 3, Ill.

Foote Prints, Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.

Fortune, Time, Inc., 540 N. Michigan Ave., Chicago 11, Ill.

Foundry, Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio.

Foundry Trade Journal, John Adam House, 17/19 John Adam St., Adelphi, London, W.C. 2, England.

G

Gas, Jenkins Publications, Inc., 198 S. Alvarado St., Los Angeles 57, Calif.

Gas Age, 48 West 38th St., New York 18, N. Y.

Gas Journal, Walter King Ltd., 11, Bolt Court, Fleet St., London, E.C. 4, England.

General Electric Review, General Electric Co., Schenectady 5, N. Y.

General Motors Engineering Journal, Educational Relations Section, Dept. of Public Relations, GM Technical Center, P.O. Box 177, North End Station, Detroit 2, Mich.

Glass, Glass Publications Ltd., 9, Moor Park Road, Northwood, Middlesex England.

Glass Industry, Ogden Publishing Co., 55 West 42nd St., New York 36, N. Y.

Government Mechanical Laboratory Japan, Bulletin, Sumiyoshi-cho Suginami-ku, Tokyo, Japan.

H

Heat Engineering, Foster Wheeler Corp., 165 Broadway, New York 6, N. Y.

Heating, Piping & Air Conditioning, Keeney Publishing Co., 6 N. Michigan Ave., Chicago 2, Ill.

Heating and Ventilating, The Industrial Press, 148 Lafayette St., New York 13, N. Y.

Henry Brutcher, Technical Translations, P.O. Box 157, Altadena, Calif.

Hitachi Review, Publication Dept., Hitachi, Ltd., No. 4, Marunouchi 1-chome, Tokyo, Japan.

Hokkaido University, Faculty of Science, Journal, The Hokkaido University, Sapporo, Japan.

I

Indian Academy of Sciences, Proceedings, Bangalore, India.

Indian Institute of Metals, Transactions, 31, Chowringhee Road, Calcutta 16, India.

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Industrial Chemist and Chemical Manufacturer, 33 Tothill St., Westminster, London, S.W. 1, England.

Industrial Diamond Review, N.A.G. Press, Ltd., 226 Latymer Court, Hammersmith, London, W. 6, England, or Henry Paulson & Co., 131 S. Wabash Ave., Chicago, Ill.

Industrial and Engineering Chemistry, American Chemical Society, 1155 Sixteenth St., N.W., Washington 6, D. C.

Industrial Finishing, Practical Publications, Inc., 1142 N. Meridian St., Indianapolis 4, Ind.

Industrial Finishing (London), Arrow Press Ltd., 157 Hagden Lane, Watford, Herts, England.

Industrial Gas, Moore Publishing Co., Inc., Emmett St., Bristol, Conn.

Industrial Heating, National Industrial Publishing Co., Union Trust Bldg., Pittsburgh 19, Pa.

Industry and Power, Maujer Publishing Co., 420 Main St., St. Joseph, Mich.
Industry & Welding, Industrial Publishing Group, 1240 Ontario St., Cleveland 13, Ohio.
Institute of British Foundrymen, Proceedings, St. John St., Chambers, Deansgate, Manchester 3, England.
Institute of Fuel, Journal, 18 Devonshire St., Portland Place, London, W. 1, England.
Institute of Industrial Science, Report, University of Tokyo, Chiba City, Japan.
Institute of Marine Engineers, Transactions, 85 Minories, London, E.C. 3, England.
Institute of Metal Finishing, Bulletin, 32 Gt. Ormond St., London, W.C. 1, England.
Institute of Metals, Bulletin, 4 Grosvenor Gardens, London, S.W. 1, England.
Institute of Metals, Journal, 4 Grosvenor Gardens, London, S.W. 1, England.
Institute of Petroleum, Journal, 26 Portland Place, London, W. 1, England.
Institute of Radio Engineers, Transactions, 1 East 79th St., New York 21, N. Y.
Institute of Welding, Transactions, 2 Buckingham Palace Gardens, London, S.W. 1, England.
Institution of Electrical Engineers, Proceedings, Savoy Place, London, W.C. 2, England.
Institution of Engineers & Shipbuilders in Scotland, Transactions, 39 Elmbank Crescent, Glasgow, C. 2, Scotland.
Institution of Mechanical Engineers, Proceedings, 1 Birdcage Walk, Westminster, S.W. 1, England.
Instrumentation, Minneapolis-Honeywell Regulator Co., Industrial Division, Wayne and Windrim Aves., Philadelphia 44, Pa.
Instruments, Instruments Publishing Co., Inc., 845 Ridge Ave., Pittsburgh 12, Pa.
Instruments and Automation, Instruments Publishing Co., Inc., 845 Ridge Ave., Pittsburgh 12, Pa.
Interchemical Review, Research Laboratories of Interchemical Corp., 432 West 45th St., New York 36, N. Y.
Iron Age, Chilton Co., Inc., 100 East 42nd St., New York 17, N. Y.
Iron & Steel, Louis Cassier Co., Ltd., Dorset House, Stamford St., London, S.E. 1, England.
Iron and Steel Engineer, Association of Iron and Steel Engineers, 1010 Empire Bldg., Pittsburgh 22, Pa.
Iron and Steel Institute, Journal, 4 Grosvenor Gardens, London, S.W. 1, England.
Iron and Steel Institute; Papers of the Affiliated Local Societies, Special Report, 4 Grosvenor Gardens, London, S.W. 1, England.

J

Journal of the Aeronautical Sciences, Institute of the Aeronautical Sciences, Inc. 2 East 64th St., New York 21, N. Y.
Journal of Agricultural and Food Chemistry, American Chemical Society, 1155 Sixteenth St., N.W., Washington 6, D. C.
Journal of Applied Chemistry, Society of Chemical Industry, 56 Victoria St., London, S.W. 1, England.
Journal of Applied Mechanics, American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y.
Journal of Applied Physics, American Institute of Physics, 57 East 55th St., New York 22, N. Y.
Journal of Chemical Education, Division of Chemical Education, American Chemical Society, 20th and Northampton Sts., Easton, Pa.
Journal of Chemical Physics, American Institute of Physics, 57 East 55th St., New York 22, N. Y.
Journal of Economic Entomology, Ashley B. Gurney, 1530 P. St., N.W., Washington 5, D. C.
Journal of the Mechanics and Physics of Solids, Pergamon Press, Ltd., Maxwell House, Marylebone Rd., London, N.W. 1, England, or 122 East 55th St., New York 22, N. Y.
Journal of Metals, Metals Branch, American Institute of Mining and Metallurgical Engineers, Inc., 29 West 39th St., New York 18, N. Y.
Journal of Nuclear Energy, Lange, Maxwell & Springer, Ltd., Maxwell House, Marylebone Road, London, N.W. 1, England,
Journal of Petroleum Technology, Petroleum Branch, American Institute of Mining and Metallurgical Engineers, 800 Fidelity Union Bldg., Dallas 1, Tex.
Journal of Physical Chemistry, American Chemical Society, 1155 Sixteenth St., N.W., Washington 6, D. C.
Journal of Rational Mechanics and Analysis, Graduate Institute for Applied Mathematics and Mechanics, Indiana University, Bloomington, Ind.

Journal of Research, National Bureau of Standards, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Journal of Scientific & Industrial Research, Assistant Secretary, Publications, Old Mill Rd., New Delhi, India.

Journal of Scientific Instruments, Institute of Physics, 47 Belgrave Square, London, S.W. 1, England.

L

Light Metal Age, 220 S. State St., Chicago 4, Ill.

Light Metals, Temple Press, Ltd., Bowling Green Lane, London, E.C. 1, England.

Linde Tips, Linde Air Products Co., 30 East 42nd St., New York 17, N. Y.

Lubrication Engineering, American Society of Lubrication Engineers, 84 East Randolph St., Chicago 1, Ill.

M

Machine Design, Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio.

Machine and Tool Blue Book, Hitchcock Publishing Co., 222 E. Willow Ave., Wheaton, Ill.

Machinery, 148 Lafayette St., New York 13, N. Y.

Machinery (London), Machinery Publishing Co., Ltd., National House, West St., Brighton 1, England.

Machinery Lloyd (Overseas Ed.), Continental & Overseas Organization Ltd., 6 Cavendish Place, Regent St., London, W. 1, England.

Magnesium, Brooks and Perkins Inc., 1950 W. Fort St., Detroit 16, Mich.

Magnesium Review and Abstracts, Magnesium Elektron Ltd., Clifton Junction, Nr. Manchester, England.

Mainspring, Associated Spring Corp., Bristol, Conn.

Marine Engineering, 30 Church St., New York 7, N. Y., or 79 W. Monroe St., Chicago 3, Ill.

Materials & Methods, Reinhold Publishing Corp., 430 Park Ave., New York 22, N.Y.

Mechanical Engineering, American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y.

Mechanical Handling, Louis Cassier Co., Ltd., Dorset House, Stamford St., London, S.E. 1, England.

Mechanical World and Engineering Record, Emmott & Co., Ltd., 31 King St. West, Manchester 3, England, or 50 Temple Chambers, Temple Ave., London, E.C. 4, England.

Memoirs of the Faculty of Engineering, Kyoto University, Kyoto, Japan.

Metal Age, Metal Information Bureau Ltd., Birkett House, 27 Albemarle St., London, W. 1, England.

Metal Finishing, Finishing Publications, Inc., 381 Broadway, Westwood, N. J.

Metal Industry, Louis Cassier Co., Ltd., Dorset House, Stamford St., London, S.E. 1, England.

Metal Powder Association, Proceedings, 420 Lexington Ave., New York 17, N. Y.

Metal Progress, American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.

Metal Treating, Metal Treating Institute, 271 North Ave., New Rochelle, N. Y.

Metal Treatment and Drop Forging, Industrial Newspapers, Ltd., 49 Wellington St., Strand, London, W.C. 2, England.

Metal Trends, American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.

Metal-Working, Sutton Publishing Co., Inc., 172 South Broadway, White Plains, N. Y.

Metallurgia, The Kennedy Press, Ltd., 31 King St., West, Manchester 3, England.

Metals (Daily Reporter Monthly Supplement), 425 West 25th St., New York 1, N. Y.

Microtecnic (English Ed.), Scriptar Ltd., 23 Avenue de la Gare, Lausanne, Switzerland.

Midwest Engineer, Western Society of Engineers, 84 E. Randolph St., Chicago 1, Ill.

Mine & Quarry Engineering, Tothill Press Ltd., 33 Tothill St., London, S.W. 1, England.

Mineral Industries, School of Mineral Industries, Pennsylvania State University, University Park, Pa.

Mines Magazine, Colorado School of Mines Alumni Assn., Frank C. Bowman, Editor, 734 Cooper Building, Denver 2, Colo.

Mining Congress Journal, American Mining Congress, Ring Building, Washington 6, D. C.

Mining Engineering, American Institute of Mining and Metallurgical Engineers, 29 West 39th St., New York 18, N. Y.

Mining Journal, 15 Wilson St., Moorgate, London, E.C. 2, England.

Mining Journal (Annual Review), 15 Wilson St., Moorgate, London, E.C. 2, England.

Mining Magazine, Mining Publications, Ltd., Salisbury House, London, E.C. 2, England.

Mining World, 121 Second St., San Francisco 5, Calif.

Modern Industrial Press, Andresen, Inc., Windsor Manor, Post Office Box 687, Pittsburgh 30, Pa.

Modern Lithography, Industry Publications, Inc., 175 Fifth Ave., New York 10, N. Y.

Modern Machine Shop, Gardner Publications, Inc., 431 Main St., Cincinnati 2, Ohio.

Modern Metals, 435 N. Michigan Ave., Chicago 11, Ill.

Modern Plastics, Breskin Publications, Inc., 575 Madison Ave., New York 22, N. Y.

Monthly Business Review, Federal Reserve Bank of Cleveland, Cleveland 1, Ohio.

N

National Academy of Sciences of the United States of America, Proceedings, University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill.

National Bureau of Standards Circular, Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

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National Conference on Industrial Hydraulics, Proceedings, John G. Duba, Conference Secretary, Illinois Institute of Technology, Technology Center, Chicago 15, Ill.

National Open Hearth Committee of the Iron and Steel Div., American Institute of Mining and Metallurgical Engineers, 29 West 39th St., New York 18, N. Y.

Nature, MacMillan & Co., Ltd., St. Martin's St., London, W.C. 2, England, or St. Martin's Press, Inc., 103 Park Ave., New York 17, N. Y.

Nondestructive Testing, Editor, 1109 Hinman Ave., Evanston, Ill.

North East Coast Institution of Engineers & Shipbuilders, Transactions, Newcastle Upon Tyne, England.

Nucleonics, McGraw Hill Publishing Co., Inc., 330 West 42nd St., New York 36, N. Y.

O

Ohio State University. Engineering Experiment Station, News in Engineering, Ohio State University, Columbus 10, Ohio.

Oil and Gas Journal, Petroleum Publishing Co., P.O. Box 1260, Tulsa, Okla.

Optical Society of America, Journal, American Institute of Physics, 57 East 55th St., New York 22, N. Y.

Ordnance, American Ordnance Association, 708 Mills Bldg., Washington 6, D.C.

Organic Finishing, Finishing Publications, Inc., 381 Broadway, Westwood, N. J.

Overseas Engineer, Temple Press, Ltd., Bowling Green Lane, London, E.C. 1, England.

P

Paint Industry Magazine, Heckel Publishing Co., Inc., 1321 Arch St., Philadelphia 7, Pa.

Paint Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London, N.W. 1, England.

Paint, Oil, & Chemical Review, Trade Review Co., 1607 Howard St., Chicago 26, Ill.

Paint and Varnish Production, Powell Magazine Inc., 855 Ave. of America, New York 1, N. Y.

Paper, Film and Foil Converter, Howard Publishing Co., 111 West Washington St., Chicago 2, Ill.

Paper Mill News, L. D. Post, Inc., 1440 Broadway, New York 18, N. Y.

Petroleum, Svenska Esso Aktiebolag, Box 7056, Stockholm, Sweden.

Petroleum Engineer, 15th Floor, 1700 Commerce St., Dallas 1, Tex.

Petroleum Processing, 330 West 42nd St., New York 36, N. Y.

Petroleum Refiner, Gulf Publishing Co., Box 2608, Houston 1, Tex.

Petroleum Times, Brettenham House, Lancaster Place, Strand, London, W.C. 2, England.

Philips Technical Review, N. V. Philips' Gloeilampenfabrieken, Technical and Scientific Literature Dept., Eindhoven, Netherlands.

Philosophical Magazine, Editors, c/o Messrs. Taylor and Francis Ltd., Red Lion Court, Fleet St., London, E.C. 4, England.

Photoengravers Bulletin, American Photoengravers Association, 166 W. Van Buren St., Chicago 4, Ill.

Physical Review, American Institute of Physics, 57 East 55th St., New York 22, N. Y.

Physical Society of Japan, Journal, c/o Dept. of Physics, Faculty of Science, University of Tokyo, Bunkyo-ku, Tokyo, Japan.

Physical Society, Proceedings, 1 Lowther Gardens, Prince Consort Rd., London, S.W. 7, England.

Physics Today, American Institute of Physics, 57 East 55th St., New York 22, N. Y.

Pipe Line Industry, Gulf Publishing Co., P.O. Box 2608, Houston 1, Tex.

Pipe Line News, Oildom Publishing Co., 101 W. Alabama, Houston, Tex.

Pit and Quarry, Pit and Quarry Publications, Inc., 431 S. Dearborn St., Chicago, 5, Ill.

Plant, Plant Publishing Co., St. Joseph, Mich.

Plating, American Electroplaters' Society, American Building, 445 Broad St., Newark 2, N. J.

Popular Science, 353 Fourth Ave., New York 10, N. Y.

Powder Metallurgy Bulletin, Dr. Paul Schwarzkopf, President, American Electro Metal Corp., 320 Yonkers Ave., Yonkers 2, N.Y.

Power, 330 West 42nd St., New York 36, N. Y.

Power Apparatus and Systems, American Institute of Electrical Engineers, 33 West 39th St., New York 18, N. Y.

Power Engineering, Technical Publishing Co., 110 S. Dearborn St., Chicago 3, Ill.

Precision Metal Molding, Industrial Publishing Group, Div. of Telenews Productions, Inc., 1240 Ontario St., Cleveland 13, Ohio.

Printing Equipment Engineer, 1276 West 3rd St., Cleveland 13, Ohio.

Process Engravers' Monthly, Art & Technics Ltd., 58 Frith St., London, W. 1, England.

Product Engineering, 330 West 42nd St., New York 36, N. Y.

Product Finishing, Sawell-Publications Ltd., 4 Ludgate Circus, London, E.C. 4, England.

Products Finishing, Gardner Publications, Inc., 431 Main St., Cincinnati 2, Ohio.

Pro-Metal, Association Metallurgique S.A., Metallverband AG., Berne, Switzerland.

Q

Quarterly of Applied Mathematics, Brown University, Providence 12, R. I.

Quarterly Journal of Mechanics and Applied Mathematics, Geoffrey Cumberlege, Oxford University Press, Amen House, London, E.C. 4, England.

R

Radio-Electronic Engineering, 64 E. Laki St., Chicago 1, Ill.

Radio-Electronics, 25 W. Broadway, New York 7, N. Y.

Railway Age, 30 Church St., New York 7, N. Y.

Railway Gazette, 33 Tothill St., Westminster, London, S.W. 1, England.

Railway Locomotives and Cars, 30 Church St., New York 7, N. Y.

Railway Track and Structures, 30 Church St., New York 7, N. Y.

Record of Chemical Progress, Kresge-Hooker Scientific Library, Wayne University, Detroit 1, Mich.

Refractories Journal, London and Sheffield Publishing Co., Ltd., 7, Chesterfield Gardens, Curzon St., Mayfair, London, W. 1, England

Refrigerating Engineering, American Society of Refrigerating Engineers, 234 Fifth Ave., New York 1, N. Y.

Research, Butterworth Scientific Publications, 88 Kingsway, London, W.C. 2, England.

Research Reviews, Office of Naval Research, Code 740, Office of Naval Research, Washington, D. C.

Research Trends, Cornell Aeronautical Laboratory, Inc., 4455 Genesee St., Buffalo 21, N. Y.

Review of Scientific Instruments, American Institute of Physics, 57 East 55th St., New York 22, N. Y.

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Rock Products, MacLean-Hunter Publishing Corp., 309 W. Jackson Blvd. Chicago 6, Ill.

Royal Aeronautical Society, Journal, 4 Hamilton Place, London, W. 1, England.

Royal Society of London, Philosophical Transactions, Burlington House, Piccadilly, London, N.W. 1, England.

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S

SAE Journal, Society of Automotive Engineers, Inc., 29 West 39th St., New York 18, N. Y.

Science, 1515 Massachusetts Ave., N. W., Washington 5, D. C.

Science Reports of the Research Institutes, Tohoku University, Sendai, Japan.

Scientific American, 2 West 45th St., New York 36, N. Y.

Scientific Lubrication, Scientific Publications, Broseley, Shropshire, England.

Scientific Monthly, 1515 Massachusetts Ave., N.W., Washington 5, D. C.

Screw Machine Engineering, 65 Broad St., Rochester 14, N. Y.

Sewage and Industrial Wastes, Federation of Sewage and Industrial Wastes Association, 325 Illinois Bldg., Champaign, Ill.

Sheet Metal Industries, Industrial Newspaper Ltd., John Adam House, 17-19 John Adam St., Adelphi, London, W.C. 2, England.

Sheet Metal Worker, 92 Martling Ave., Tarrytown, N. Y.

Shell Aviation News, St. Helens Court, Great St. Helens, London, E.C. 3, England.

Skillings' Mining Review, 810 Fidelity Building, Duluth 2, Minn.

Smokeless Air, National Smoke Abatement Society, 30 Grosvenor Place, London, S.W. 1, England.

Society for Experimental Stress Analysis, Proceedings, Central Square Station, P.O. Box 168, Cambridge 39, Mass.

Society of Glass Technology, Journal, "Thornton," Hallam Gate Rd., Sheffield, 10, England.

South African Mining and Engineering Journal, South African Mining Journal Syndicate Ltd., Balgownie House, 66 Commissioner St., Johannesburg, Union of South Africa.

Southern Chemical Industry, 5009 Peachtree Rd., Atlanta, Ga.

Steel, Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio.

Steel Equipment & Maintenance News, 528 Washington Rd., Pittsburgh 28, Pa.

Steel Processing, Steel Publications, Inc., 4 Smithfield St., Pittsburgh 30, Pa.

Steelways, American Iron and Steel Institute, 350 Fifth Ave., New York 1, N. Y.

Sulzer Technical Review, Sulzer Brothers Ltd., Winterthur, Switzerland.

Sylvania Technologist, Sylvania Electric Products, Inc. 1740 Broadway, New York 19, N. Y.

T

Tappi, Technical Association of the Pulp and Paper Industry, 122 East 42nd St., New York 17, N. Y.

Technology Reports, Tohoku University, Faculty of Engineering, Sendai, Japan.

Technology Review, Room 1-281, Massachusetts Institute of Technology, Cambridge 39, Mass.

Tele-Tech, 480 Lexington Ave., New York N. Y.

Textile Industries, 806 Peachtree St., N. E., Atlanta 5, Ga.

Times Review of Industry, Printing House Square, London, E.C. 4, England.

Times Science Review, The Times, London, E.C. 4, England.

Tin and Its Uses, International Tin Study Group, 7 Carel van Bylandtlaan, The Hague, Netherlands.

Tool Engineer, American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38, Mich.

Tooling and Production, Huebner Publications, Inc., 1975 Lee Rd., Cleveland 18, Ohio.

Trend in Engineering (University of Washington), Engineering Experiment Station, University of Washington, Seattle 5, Wash.

U

University of Illinois Bulletin, Engineering Experiment Station, Urbana, Ill.

U. S. Atomic Energy Commission, Documents Publications Section, Technical Information Service, Oak Ridge, Tenn.

U. S. Bureau of Mines, Office of Technical Services, Department of Commerce, Washington 25, D. C.

U. S. National Advisory Committee for Aeronautics, 1724 F St., N.W., Washington 25, D. C.

Utilization, Mechanization, Inc., Washington, D. C.

V

Vacuum, W. Edwards & Co., Ltd., Worsley Bridge Rd., Lower Sydenham, London, S.E. 26, England.

W

Water & Sewage Works, 155 East 44th St., New York 17, N. Y.
Welder, Murex Welding Processes Ltd., Waltham Cross, Herts, England.
Welding Engineer, 330 West 42nd St., New York 36, N. Y.
Welding Journal, American Welding Society, 33 West 39th St., New York 18, N.Y.
Welding and Metal Fabrication, Louis Cassier Co., Ltd., Dorset House, Stamford St., London, S.E. 1, England.
Welding Research, Institute of Welding, 2 Buckingham Palace Gardens, London, S.W. 1, England.
Western Machinery and Steel World, 681 Market St., San Francisco 5, Calif. or 8943 Wilshire Blvd, Beverly Hills, Calif.
Western Metals, Jenkins Publications, Inc., 198 S. Alvarado St., Los Angeles 5, Calif.
Western Miner and Oil Review, Gordon Black Publications Ltd., 505 Metropolitan Building, Vancouver 1, Canada.
Westinghouse Engineer, P.O. Box 2278, 3 Gateway Center, Pittsburgh 30, Pa.
Wire Industry, 33 Furnival St., London, E.C. 4, England.
Wire and Wire Products, 453 Main St., Stamford, Conn.
World Oil, Gulf Publishing Co., 3301 Buffalo Dr., Houston 6, Tex.

II. FOREIGN-LANGUAGE PERIODICALS

The journals listed here are limited to those published in foreign languages. Foreign publications in English, such as those of Australia, India and certain Japanese journals, are listed in Section I. English-Language Journals and Serials.

Most of the foreign journals (except Russian) are available through Stechert-Hafner, Inc., 31 E. 10th St., New York 3, N. Y. The Russian journals can be ordered from Four Continent Book Corp., 38 W. 58th St., New York 16, N. Y.

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A

<u>ABM (Boletim da associacao brasileira de metais)</u>
Instituto de Pesquisas Technologicas
Praca Coronel Fernando Prestes, 110
Sao Paulo, Brasil

<u>Aciers Fins & Speciaux Francais</u>
La Chambre Syndicale des Producteurs d'Aciers Fins et Speciaux
12, Rue de Madrid
Paris (VIII^{e})
France

<u>Acta Chemica Scandinavica</u>
Messrs. Einar Munksgaard
Nörregade 6
Copenhagen
Denmark

<u>Acta Physica Academiae Scientiarum Hungaricae</u>
"Kultúra" Konyv és Hírlap Külkereskedelmí Vállalat
Acta Physica
<u>Budapest</u>, VI., Sztálin-út 21.
Hungary

<u>Acta Physica Austriaca</u>
Springer-Verlag
<u>Wien I</u>
Mölkerbastei 5
Austria

<u>Acta Polytechnica</u>
Swedish Academy of Engineering Sciences
Stockholm
Sweden

<u>Acta Technica Academiae Scientiarum Hungaricae</u>
"Kultúra" Kőnyv és Hírlap Külkereskedelmi Vállalat
<u>Budapest</u>, VI, Sztálin-út 21
Hungary

<u>Aeronautical Research Institute of Sweden, Report</u>
Aeronautical Research Institute
Stockholm
Sweden

<u>Alluminio</u>
Instituto Sperimentale dei Metalli Leggeri
<u>Milano</u>
via della Posta 8/10
Italy

Aluminium
Verlag der Aluminium-Zentrale e.V.
Düsseldorf
Alleestrasse 31
Germany
Aluminium (Budapest)
Nehézipari Kőnyv- és Folyóiratkiadó Vállalat
Budapest, V., Nagy Sandor-utca 6
Hungary
Aluminium Ranshofen, Mitteilungen
Österreichische Metallwerke Aktiengesellschaft
Wien I
Freyung 1
Austria
Aluminium Suisse
A. G. Fachschriften-Verlag & Buchdruckerei
Stauffacherquai 40
Zürich 4
Switzerland
Annalen der Physik
Johann Ambrosius Barth
Leipzig C 1
Salomonstr. 18 B
Germany
Annales de chemie (Paris)
Librairie Masson et C^{ie},
120, Boulevard Saint-Germain
Paris (VI^{e})
France
Archiv für das Eisenhuttenwesen
Verlag Stahleisen GmbH.
Düsseldorf
Breite Strasse 27
Germany
Archiv für technisches Messen
R. Oldenbourg Verlag
München
Lotzbeckstrasse 2b
Germany
Arkiv för Fysik
Almqvist & Wiksells Boktryckeri AB
Stockholm
Sweden
Avtogennoe Delo
Glavkislorod
Moskva, Spartakovskaya 2a
(Moscow, U.S.S.R.)

B

Banyaszati Lapok
Nehézipair Kőnyv- és Folyóiratkiadó Vállalat
Budapest, V., Nagy Sandor-utca 6
Hungary
Bedrijf en Techniek
N. V. Uitgeversmij Diligentia
Kalverstraat 35
Amsterdam C
Holland
Berg- und hüttenmännische Monatshefte der montanistischen hochschule in Leoben
Springer-Verlag
Wien I
Mölkerbastei 5
Austria
Berichte der deutschen keramischen gesellschaft
Deutsche Keramische Gesellschaft e.V. and Verein Deutscher Emailfachleute e.V.
Bonn-Rh.
Poppelsdorfer Allee 15
Germany
Brennstoff-Wärme-Kraft
Deutscher Ingenieur-Verlag GmbH.
Düsseldorf
Ingenieurhaus, Prinz-Georg-Strasse 77/79
Germany
Bulletin de la societe chimique de France
Masson et C^{ie}, Dépositaires
Libraries de l'Académie Médecine
120, Boulevard Saint-Germain
Paris (VI^{e})
France

C

Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques
Centre de Documentation Sidérurgique
6, Rue de Lota
Paria (XVI^{e})
France
Chaleur & Industrie
Henry Cassan
2, Rue des Tanneries
Paris ($XIII^{e}$)
France
Chemie-Ingenieur Technik
Verlag Chemie, GmbH.
(17a) Weinheim/Bergstrasse
Pappelallee 3
Germany
Chemische Technik
Verlag Technik
Berlin NW 7
Unter den Linden 12
Germany
Ciencia y tecnica de la Soldadura
Instituto de la Soldadura
Goya, 58
Madrid
Spain

Comptes rendus
Gauthier-Villars
55 quai des Grands-Augustins
Paris (VI^{e})
France

D

DOCAERO; revue documentaire de la technique aeronautique mondiale
2 et 4 Avenue de la Porte-d'Issy (Cite de l'Air)
Paris (XV^{e})
France

Doklady Akademii Nauk SSSR
Akademii Nauk SSSR
Moskva, Shubinskii per., 10
(Moscow, U.S.S.R.)

Draht (German Ed.)
Prost & Meiner-Verlag
(13a) Coburg/Ofr.
Bahnhofstrasse 31
Germany

E

Elektrichestvo
Moskva, Glavnyi Pochtamt
Pochtovyi Iashchik no. 648
(Moscow, U.S.S.R.)

Elektrotechische Zeitschrift
VDE-Verlag GmbH.
Berlin
Wuppertal-Eilberfeld
Briller Strasse 99
Germany

Elektrotechnika
Nehézipair Kőnyv- és Folyóiratkiadó Vállalat
Budapest, V., Nagy Sandor-utca 6
Hungary

Energietechnik
VEB Verlag Technik
Berlin NW 7
Unter den Linden 12
Germany

Engenharia, mineração e metalurgia
Revista de Mineração e Metalurgia Ltda.
Rua 7 de Setembro, 135-2.
Rio de Janeiro
Brazil

Erdöl und Kohle
Industrieverlag von Hernhaussen, Kommanditgesellschaft
Hamburg 11
Rődingsmarkt 24
Germany

Ericsson Review
Hemming Johansson
Esselte AB
Stockholm
Sweden

F

Fachhefte für die Chemigraphie, Lithographie und den Tiefdruck
Conzett und Huber
Zürich 4
Morgartenstrasse 29
Germany

Fette, Seifen, Anstrichmittel
Industrieverlag von Hernhaussen KG
Hamburg 11
Germany

Fizika v Shkole
Gosudarstvennoe uchebno-pedalogicheskoe izdatel'stvo ministerstva prosveshcheniia RSFSR
Moskva, Chistye prudy, 6.
Uchedgiz Ministerstva prosveshcheniia RSFSR
(Moscow, U.S.S.R.)

Flamme et Thermique
5, Rue Michel-Ange
Paris (XVI^{e})
France

Fonderie
Editions Techniques des Industries de la Fonderie
12, Avenue Raphaël
Paris (XVI^{e})
France

Forschung auf dem Gebiete des Ingenieurwesens
Deutscher Ingenieur-Verlag GmbH.
Düsseldorf
Germany

Fortschritte der chemischen Forschung
Springer-Verlag
Berlin W35
Reichpietschufer 20
Germany

FTZ Fernmeldetechnische Zeitschrift
Friedr. Vieweg & Sohn
(20b) Braunschweig
Burgplatz 1
Germany

Fusion de Metales
Prof. Enedelio Garza G.
Apartado 667
Monterrey, N. L.
Mexico

G

Gas und Wasserfach
R. Oldenbourg-Verlag
München 1
Schliessfach 31,
Germany

Giesserei
Giesserei-Verlag GmbH.
Düsseldorf
Breite Strasse 27
Germany

Gjuteriet
Karlavägen 43
2 tr., Stockholm o
Sweden

Glückauf
Verlag Glückauf GmbH.
Essen
Bismarckstrasse 41, Postfach 1794
Germany

Government Mechanical Laboratory Japan, Bulletin
Government Mechanical Laboratory
Sumiyoshi-cho Suginami-ku
Tokyo
Japan

H

Helvetica Chimica Acta
Schweizerische Chemische Gesellschaft
Basel 7
Schweiz
Switzerland

Helvetica Physica Acta
Verlag-Birkhauser A.G.
Basel 7
Schweiz
Switzerland

Hokkaido University Faculty of Science, Journal
The Hokkaido University
Sapporo
Japan

Hutnicke Listy
Mucednicka 8
Brünn-Zabovresky
Czechoslovakia

Hutnik
Ul. Stawowa 19
Stalinogrod
Poland

I

Industria Mecanica
Associazione Nazionale Industria Meccanica Varia ed Affini
Milano
via Santa Maria Alla Porta 10
Italy

IVA Tidscrift for Teknish-Vetenskaplig Forskning
Scientific Engineering Research
Royal Swedish Academy of Engineering Sciences
Stockholm
Sweden

Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk
Akademii Nauk SSSR
Moskva, Shubinskii per., 10
(Moscow, U.S.S.R.)

Izvestiia Akademii Nauk SSSR, Seriia Geologicheskaia
Akademii Nauk SSSR
Moskva, Shubinskii per., 10
(Moscow, U.S.S.R.)

J

Jernkontorets Annaler
Bergsingenjör Einar Öhman
Kungsträdgardsgatan 6
Stockholm C
Sweden

Journal de chimie physique
Société de Chimie Physique
École Nationale Supérieure de Chimie
11, Rue Pierre-Curie
Paris (V^{e})
France

Journal du Four Electrique
Publications Miniéres et Métallurgiques
86 Rue Cardinet
Paris (XVII^{e})
France

Journal de physique et le radium
Société Francaise de Physique
12, Place Henri Bergson
Paris (VIII^{e})
France

Journal des recherches du centre national de la recherche scientifique
Centre National de la Recherche Scientifique
13, Quai Anatole-France
Paris (VII^{e})
France

K

Kautschuk und Gummi
Verlag fur Radio-Foto-Kinotechnik GmbH.
Berlin-Borsigwald
(Westsektor)
Germany

Kohaszati Lapok
Nehézipari Könyv- és Folyóiratkiadó Vállalat
Budapest, V., Nagy Sandor-utca 6
Hungary

Kolloid-Zeitschrift
Verlag Dr. Dietrich Steinkopff
Darmstadt
Holzhofallee 35
Germany

Kunstoffe
Carl Hanser Zeitschriftenverlag GmbH.
München 27
Leonhard-Eck-Str. 7
Germany

L

Liteinoe Proizvodstov
Moskva, Neglinnaia, 23
(Moscow, U.S.S.R.)

M

Magyar Kemiai Folyoirat
Budapest, VIII., Puskin-ucta 11-13
Hungary

Mekhanizatsiia Stroitelbstva
Gosurdarstvennoe izdatel'stvo literatury po stroitel'stvu i arkhitekure
Moskva, 12, Tret'rakovskii, d. 1, 2-i et.
(Moscow, U.S.S.R.)

Metalen
Drukkerij-Uitgeverij "De Hofstad"
Scheepmarkersstraat 1-3
's-Gravenhage
Netherlands

Metall
Metall-Verlag GmbH.
Berlin-Grunewald
Hubertusallee 18
Germany

Metalloberfläche
Carl Hanser Zeitschriftenverlag GmbH.
München 27
Leonhard-Eck-Strasse 7
Germany

Metallurgia italiana
Associazione Italiana di Metallurgia
Milano
via Moscova 16
Italy

Metallurgie et la construction mecanique
79, Champs-Élysées
Paris (VIII^e)
France

Metallurgie und Giesserei Technik
VEB Verlag Technik
Berlin NW 7
Unter den Linden 12
Germany

Metals (Japanese)
Agne Publishing Co.
10 Ichibancho
Chiyodaku
Tokyo
Japan

Metaux, Corrosion-Industries
Editions Métaux
32, Rue du Marechal Joffre
St.-Germain-en-Laye (Seine et Oise)
France

Monatshefte für Chemie
Springer-Verlag
Wien I
Mölkerbastei 5
Austria

Moscow Universiteta, Vestnik, Seriia Fiziko-Matematicheskikh i Estestvennykh Nauk
Moskovskogo Universiteta
Moskva, Leninskie gory, MGU
(Moscow, U.S.S.R.)

Moskovskogo Universiteta, Vestnik, Seriia Fiziko-Matematicheskikh i Estestvennykh Nauk
Moskovskogo Universiteta
Moskva, Leninskie gory, MGU
(Moscow, U.S.S.R.)

N

Nachrichtentechnik
VEB Verlag Technik
Berlin NW 7
Unter den Linden 12
Germany

Naturwissenschaften
Springer-Verlag
Berlin W 35
Reichpietschufer 20
Germany

Nauka i Zhizn
Nauka i Zhizn
Moskva, Novaia ploshchad', 4.
(Moscow, U.S.S.R.)

Neftianoe Khoziaistvo
Gosudarstvennoe nauchno-tekhnicheskoe izdatel'stvo neftianoi i gorno-toplivnoi literatury
Moskva, Tret'iakovskii proezd, 1/19
(Moscow, U.S.S.R.)

Netherlands National Luchtvaart-laboratorium Report
National Aeronautical Research Institute
Amsterdam
Holland

Nuovo Cimento
Editore Nicola Zanichelli
Bologna
via Irnerio 34
Italy

O

Öntöde
Nehézipari Könyv- és Folyóiratkiadó Vállalat
Budapest, V., Nagy Sandor-utca 6
Hungary

Optik
Wissenschaftliche m.b.H.
Stuttgart 1
Postfach 40
Germany

Ossature metallique
Le Centre Belgo-Luxembourgeois d'Information de l'Acier
154, Avenue Louise
Bruxelles
Belgium

P

Petroleum
Svenska Esso Aktiebolag
Box 7056
Stockholm 7
Sweden

Physica
Dr. W. J. Beekman
Treasurer of the Physicist Foundation
Bylhouwerstraat 6
Utrecht, Nederland
(Netherlands)

Prace Instytutow Ministerstwa Hutnictwa
Institut Metalurgii
Gliwice
ul. K. Miarki 12/14
Poland

Prikladnaia Matematika i Mekhanika
Akademii Nauk SSSR
Moskva, Shubinskii per., 10
(Moscow, U.S.S.R.)

Priroda
Akademii Nauk SSSR
Moskva, Shubinskii per., 10
(Moscow, U.S.S.R.)

Pro-Metal
Association Métallurgique S.A.
Metallverband AG.
Berne
Switzerland

Przemysl Chemiczny
Przemyst Chemiczny
Warszawa, ul. Foksal 18.
(Warsaw, Poland)

R

Recherche Aéronautique
De l'Office National d'Études et de Recherches Aéronautiques
29, Avenue de la Division Leclerc
Chatillon-sous-Bagneux
Seine
France

Reports of the Government Chemical Industrial Research Institute, Tokyo
Government Chemical Industrial Research Institute
1-chome, Hatagaya Hon-machi
Shibuya-ku
Tokyo
Japan

Revue de l'Aluminium
77, Boulevard Malesherbes
Paris (VIII^e)
France

Revue generale des sciences pures et appliquees
Société d'Edition d'Énseignement Supérieur
5, place de la Sorbonne
Paris (V^e)
France

Revue de Metallurgie
25, Rue de Clichy
Paris (IX^e)
France

Revue de la Soudure (Brussels)
l'Institut Belge de la Soudure
Rue des Drapiers, 21
Bruxelles
Belgium

Revue Universelle des mines
l'Association des Ingenieurs sortis de l'École de Liège
12, Quai Paul Van Hoegaerden
Liège
Belgium

Rivista dei Combustibili
Liberia Editrice Politecnica
Milano
via Giovanni Pascoli, 55
Italy

Rudarsko-Metalurski Zbornik
Rudarsko-metalurški zbornik
Ljubljana, Aškerčeva 32
p.p. 311, Jugoslavija
(Ljubljana, Yugoslavia)

S

Schweissen und Schneiden
Friedr. Vieweg & Sohn
(20b) Braunschweig
Burgplatz 1
Germany
Schweisstechnik
Schweisstechnischen Zentralanstalt
Wien XVIII
Schumanngasse 31
Austria
Schweizer Archiv für angewandte Wissenschaft und Technik
Buchdruckerei Vogt-Schild AG
Solothurn
Switzerland
Sel'khozmashina
Moskva, ul- Kirova, 20
3-etazh
(Moscow, U.S.S.R.)
Silikat Technik
VEB Verlag Technik
Berlin NW 7
Unter den Linden 12
Germany
Slévarenství
Státní nakladatelství technické literatury
Praha, Spálená 51
(Prague, Czechoslovakia)
Smit Mededelingen
Willem Smit & Co's. Transformatorenfabriek N.V.
Nijmegen
Netherlands
Soudure et Techniques connexes
Publications de la Soudure Autogéne
39, rue d'Amsterdam
Paris (VIII^e)
France
Sprechsaal
Verlag Sprechsaal, Müller & Schmidt
Coburg
Mauer 2
Germany
Stahl und Eisen
Verlag Stahleisen GmbH.
Düsseldorf
Breite Strasse 27 (Schliessfach 2507)
Germany
Stanki i Instrument
Moskva 12, ul. Kuibysheva, 4, pom. 12
(Moscow, U.S.S.R.)
Staub
Deutscher Ingenieur-Verlag GmbH.
Düsseldorf
Germany
Steklo i Keramika
Moskva, ul. Chkalova, 46/48
(Moscow, U.S.S.R.)
Svenska Plast Föreningen Tekniska Meddelanden
Stockholm
Sweden
Svetsaren
Elektriska Svetsningsaktiebolaget
Göteborg 8
Sweden

T

Technik
Verlag Technik GmbH.
Berlin NW 7
Unter den Linden 12
Germany
Technique et science aéronautiques
6, rue Cimarosa
Paris (XVI^e)
France
Tecnica Italiana
Rivista d'Ingegneria i Scienze
Trieste
via Beccaria 6
Italy
Tecnica Metalurgica
La Asociation Tecnica Española de Estudios Metalurgicos
Paseo de Gracia, 50
Barcelona, España
(Spain)
Teknisk Ukeblad
Den Norske Ingeniorforening
Og Den Polytekniske Forening
Oslo
Norway

U

Umschau in Wissenschaft und Technik
Umschau Verlag
Frankfurt am Main
Germany
Uspekhi Fizicheskikh Nauk
Gosudarstvennoe izdatelstvo tekhniko-teoreticheskoi literatury
Moskva, B. Kaluzhskaia, 15
(Moscow, U.S.S.R.)

V

VDI Zeitschrift des Vereines deutscher Ingenieure
Deutscher Ingenieur-Verlag GmbH.
Düsseldorf
Prinz-Georg-Str. 77/79
Germany

Verres et refractaires
Societé d'Editions Verrieres et Céramiques
34, rue Michel-Ange
Paris (XVI^{e})
France

Vestnik Akademii Nauk SSSR
Akademii Nauk SSSR
Moskva, Shubinskii per., 10
(Moscow, U.S.S.R.)

Vestnik Mashinostroeniia
Mashgiz, Moskva, 12
Staropanskii Nereulok, 3
(Moscow, U.S.S.R.)

Vide
Société Francaise des Ingénieurs Techniciens du Vide
44, rue de Rennes
Paris (VI^{e})
France

W

Werkstoffe und Korrosion
Verlag Chemie GmbH.
Weinheim/Bergstrasse
Germany

Z

Zeitschrift für analytische Chemie
Springer-Verlag
Heidelberg
Neuenheimer Landstrasse 24
Germany

Zeitschrift für angewandte Physik
Springer-Verlag
Berlin W 35
Reichpietschufer 20
Germany

Zeitschrift für anorganische und allgemeine Chemie
Johann Ambrosius Barth
Leipzig C 1
Salomonstrasse 18B
Germany

Zeitschrift für Elektrochemie
Verlag Chemie GmbH.
Weinheim/Bergstrasse
Germany

Zeitschrift fur Erzbergbau und Metallhüttenwesen
Dr. Riederer-Verlag GmbH.
Stuttgart S
Marienstr. 50
Germany

Zeitschrift für Metallkunde
Dr. Riederer-Verlag GmbH.
Stuttgart S
Marienstr. 50
Germany

Zeitschrift für Naturforschung
Verlag der Zeitschrift für Naturforschung
Tübingen
Mathildenstrasse 20
Germany

Zeitschrift für Physik
Springer-Verlag
Berlin W 35
Reichpietschufer 20
Germany

Zeitschrift für physikalische Chemie
Akademische Verlagsgesellschaft M.B.H.
Frankfurt am Main
Holbeinstrasse 25/27
Germany

Zeitschrift für Schweisstechnik
Stauffacherquai 36
Zürich 1
Switzerland

Zeitschrift des Vereines deutscher Ingenieure
Deutscher Ingenieur-Verlag GmbH.
Düsseldorf
Prinz-Georg-Str. 77/79
Germany

Zhurnal Fizicheskoi Khimii
Akademii Nauk SSSR
Moskva, Shubinskii per., 10
(Moscow, U.S.S.R.)

Zhurnal Prikladnoi Khimii
Izdatel'stvo Akademii Nauk SSSR
Leningrad, B. O.
Mendeleevskaia lin., d. 1
(Leningrad, U.S.S.R.)

Zhurnal Tekhnicheskoi Fiziki
Zhurnal Tekhnicheskoi Fiziki
Leningrad, 164, B. O.
Mendeleevskaia lin., 1.
(Leningrad, U.S.S.R.)

AUTHOR INDEX

Authors' names are indexed by section number and item number rather than by page. The numerals and letters preceding the hyphen refer to the section; the numerals following the hyphen refer to the number of the literature listing.

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SUBJECT INDEX

Since the annotations in the REVIEW are classified on the basis of properties and processes, the emphasis in the index has been placed on materials, products, and applications. Wherever possible, items have been indexed under the name of the material or product involved; entries under names of processes and properties usually refer only to general treatments of the subject. In general, cross-references have not been made from property and process headings to materials and products.

Alloy systems in which one member predominates have been entered under the name of that member only; where members are present in a system in equal percentages, entries have generally been made under the name of each member. The subheading "systems" under elements has been used for phase studies, constitution diagrams, intermetallic compounds, etc.; in these cases, entries have been made under the name of each element involved.

The main headings have been subdivided as the number of entries and the specificity of the material itself seemed to warrant. Where the user of the index finds undivided headings, he should remember that the letter designation for each item indicates its general subject matter and thus serves in an indexing capacity. — *M. S. Wright*

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